W. Huang

RCRA PERMIT APPLICATION
Boilers H-530A and H-530B
GE Plastics Mt. Vernon, Inc.

Trial Burn Plan

Prepared for:

GE Plastics Mt. Vernon, Inc.
One Lexan Lane
Mt. Vernon, IN 47620-9364
EPA ID# IND006376362

Prepared by:

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Herndon, VA 20171-3426

Revision 2
February 2001

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TRIAL BURN PLAN

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1.0 INTRODUCTION

GE Plastics Mt. Vernon, Inc. (GEPMV) operates an integrated plastics manufacturing facility located in Mt. Vernon, Indiana (U.S. EPA ID# IND006376362). The facility includes a phenol manufacturing operation that generates five hazardous and one non-hazardous waste streams, which are combined and burned for energy recovery in two on-site boilers. These boilers, designated as Boilers H530A and H530B, are therefore subject to 40 CFR Subpart H: Hazardous Waste Burned in Boilers and Industrial Furnaces, commonly referred to as the BIF Rule. The steam produced is used to supplement the steam requirements for the entire manufacturing facility.

GEPMV became subject to the BIF Rule when the regulation was promulgated in 1991. Since that time, GEPMV has maintained compliance with the regulation and operated the boilers under the interim status provisions of the rule. The boilers currently operate under the August 2000 Revised Recertification of Compliance that is based on an Adjusted Tier I strategy for metals and chlorine provided in 40 CFR 266.106(e) and 107(e).

This Trial Burn Plan (TBP) and the companion Quality Assurance Project Plan (QAPP) describe how GEPMV intends to conduct a trial burn for the BIF Rule-regulated boilers at the Mt. Vernon, Indiana facility. The trial burn will be conducted as part of the RCRA permitting process. This Trial Burn Plan specifies how testing will be conducted to demonstrate that the regulated units comply with applicable emission standards and to establish operating limits that will be used in an operating permit. In addition, this Trial Burn Plan describes testing that will be conducted to generate information for use in a human health and ecological risk assessment, in accordance with recent U.S. EPA policy and guidance.

GEPMV plans to conduct the trial burn as the testing associated with the future interim status recertification, which would require that the trial burn be conducted in December 2000 according to the plant's compliance schedule. GEPMV intends to request a case-by-case extension for conducting the testing in April 2001 and submitting the Recertification of

Compliance 90 days later. This Trial Burn Plan also fulfills the requirements of the Compliance Test Notification for interim status testing in accordance with 40 CFR 266.103(c)(2).

GEPMV proposes to conduct trial burn test runs under three test conditions to account for the combination of testing requirements. Depending on the specific test condition, the operations can either be described as HIGH or LOW. HIGH operating conditions are designed for system operation at a high combustion chamber temperature, high production rate, and high waste fuel feed rate. LOW operating conditions are designed for system operation at a low combustion chamber temperature and low production rate. GEPMV will use an Adjusted Tier I strategy to demonstrate compliance with the emission standards for ash, BIF metals, hydrogen chloride, and chlorine.

This Trial Burn Plan is being submitted to U.S. EPA Region 5 as part of a RCRA Part B permit application. EPA originally requested the permit application in a letter received in August 1998. GEPMV submitted Revision 0 of this document in February 1999. U.S. EPA provided comments on Revision 0 in March 2000. After addressing these comments, GEPMV is submitting Revision 1 of this document in September 2000.

2.0 PROJECT DESCRIPTION

This section provides an overview of the Trial Burn Plan, including a general description of the facility, a summary of the BIF units' compliance history, the purpose of the Trial Burn, and the organization of the Trial Burn Plan.

2.1 General Facility Description

GEPMV operates an integrated plastics manufacturing facility located in Mt. Vernon, Indiana. The facility includes a phenol manufacturing operation that generates five hazardous and one non-hazardous waste streams, which are combined and burned for energy recovery in two on-site boilers. These boilers are therefore subject to 40 CFR Subpart H: Hazardous Waste Burned in Boilers and Industrial Furnaces, commonly referred to as the BIF Rule. The steam produced is used to supplement the steam requirements for the entire manufacturing plant.

The two boilers subject to the BIF Rule are designated Boilers H530A and H530B. Each boiler is of water-tube type and is designed to produce 70,000 pounds of steam per hour. Boilers H530A and H530B are the same Babcock & Wilcox Model 103-88 package boiler units and are typically operated at the same time. The boilers share a common stack, and there are no air pollution control systems.

The BIF units are fed a combination of five hazardous and one non-hazardous waste streams. The hazardous waste streams include a phenol distillation bottoms stream, a distillate stream, and three ignitable (D001) streams. The phenol distillation bottoms stream is a process-listed hazardous waste (K022), and the distillate stream exhibits the 40 CFR 261 characteristics of toxicity for benzene (D018). The combined waste fuel fed to the boilers is designated K022, D001 and D018 because the non-hazardous and hazardous streams are mixed in tanks prior to being fed to the boilers.

General facility information is provided below:

Owner:	Mt. Vernon Phenol Plant Partnership
Operator:	GE Plastics Mt. Vernon, Inc.
Street Address:	1 Lexan Lane Mt. Vernon, IN 47620-9364
U.S. EPA ID #:	IND006376362
Facility Contact:	Dave Perkins (812) 831-7307

2.2 Interim Status Summary

2.2.1 Interim Status History

The two regulated units at the facility have operated under the interim status requirements of the BIF Rule since its promulgation in 1991. Table 2-1 summarizes the relevant documents that have been prepared and submitted to U.S EPA Region 5 since 1991.

2.2.2 Current Interim Status Operations

The boilers currently operate under the August 2000 Revised Recertification of Compliance that is based on an Adjusted Tier I strategy for metals and chlorine provided in 40 CFR 266.106(e) and 107(e). The revised recertification uses data for the ash feed rate, particulate matter (PM) emissions, and carbon monoxide (CO) emissions from a compliance test conducted in February 1998.

Table 2-1

Interim Status Summary

Date	Document	Description
August 1991	Precompliance Certification	Initial engineering document to demonstrate compliance with interim status requirements.
December 1991	Revised Precompliance Certification	Increased waste fuel feed rate limits as a result of reduction in waste fuel content.
August 1992	Revised Precompliance Certification	Switched to Adjusted Tier I basis from Tier III for all metals.
August 1992	Compliance Test Notification	Test plan that describes how and when the compliance test will be conducted.
January 1993	Correspondence	GEPMV requested guidance on repeating CEMS certification testing
January 1993	Correspondence	GEPMV requested a 180-day extension for the certification of compliance for Boiler H530A
February 1993	Correspondence	EPA requests the available data before granting extension
February 1993	Certification of Compliance	Report test results to demonstrate interim status compliance and establish operating limits.
October 1993	Revised Precompliance Certification	Revised air dispersion modeling
October 1993	Revised Certification of Compliance	Chlorine compliance changed from Tier III to Adjusted Tier I approach
September 1995	Compliance Test Notification	Test plan that describes how and when the compliance test will be conducted.
January 1996	Recertification of Compliance (RoC)	Report test results to demonstrate interim status compliance and establish operating limits.
January 1998	Compliance Test Notification	Test plan that describes how and when the compliance test will be conducted.
February 1998	Recertification of Compliance	Report test results to demonstrate interim status compliance and establish operating limits.
August 1998	Call for Part B Permit Application	EPA call for GEPMV's updated Part B Permit Application
February 1999	RCRA Permit Class 3 Modification	Submittal includes the following: • RCRA Facility Plans • Trial Burn Plan • Quality Assurance Project Plan • Human Health Risk Assessment Protocol • Ecological Risk Assessment Protocol
March 2000	Comments	Final comments by EPA on the RCRA permit application
May 2000	Extension Approval	EPA establishes a September 30, 2000 due date for the RCRA permit
June – September 2000	Response to Comments	GEPMV's response to EPA comments on the RCRA permit application
August 2000	Revised Precompliance and Revised Recertification of Compliance	Correction to dilution factor and corresponding allowable emissions and Adjusted Tier I feed rate limits

2.3 Purpose

In a letter received in August 1998, U.S. EPA Region 5 officially requested that GEPMV submit a RCRA Part B permit application for the boilers in accordance with 40 CFR Part 270. GEPMV submitted the original permit application in February 1999. EPA returned comments on that application in March 2000. After addressing EPA's comments, a revised permit application is being submitted to EPA in September 2000. This Trial Burn Plan fulfills part of the requirements for the permit application. The other requirements listed in 40 CFR Part 270 are provided in other portions of the application.

This Trial Burn Plan and the companion QAPP describe how GEPMV intends to conduct a trial burn for the BIF Rule-regulated boilers at the Mt. Vernon, Indiana facility. The trial burn will be conducted as part of the RCRA permitting process. Trial burn plans are generally developed to describe how testing will be conducted to demonstrate that regulated units comply with applicable emission standards and to establish operating limits that will be used in an operating permit. Recent U.S. EPA policy and guidance has also stipulated that trial burn plans be developed and trial burns be conducted to generate information for use in risk assessments. This Trial Burn Plan addresses these areas. The four objectives of the trial burn are listed below and explained in detail in Section 3 of this Trial Burn Plan.

1. Define the limits that GEPMV desires to have for the continued use of hazardous waste fuels under a RCRA permit.

2. Demonstrate that the boilers comply with the applicable emission standards of the BIF Rule as defined in 40 CFR Parts 266.104 through 266.107, while burning waste fuels.

3. Generate feed rate, operating condition, and emission data to use to establish limits that will be specified in the RCRA operating permit.

4. Generate feed rate, operating condition, and emission data that can be used to conduct a human health and ecological risk assessment that will support the granting of a RCRA operating permit.

Additional details regarding the specific design of test conditions, parameters measured, and emission data collected are provided later in this Trial Burn Plan.

2.4 Trial Burn Plan Organization

This Trial Burn Plan is organized to provide the information required in 40 CFR Part 270. Section 3 describes the overall strategy that GEPMV plans to use to comply with the applicable regulatory requirements. Section 4 describes the feed streams to the regulated units. Section 5 provides a technical description of the units and their auxiliary systems. Section 6 describes the test protocols and planned operating conditions. Section 7 generally describes the sampling and analytical methods to be used during the trial burn. Section 8 generally describes the quality assurance and quality control aspects of the plan. Section 9 provides a schedule for conducting the trial burn. Additional detailed information is provided in the appendices.

This Trial Burn Plan is being submitted as part of a RCRA Part B permit application. The QAPP, a separate but related document, is also being submitted as part of the application (Appendix A). The Trial Burn Plan includes information related to the planned testing and describes the rationale and protocols for the test; the QAPP contains the detailed information related to sampling methods, sample handling, analytical methods, quality assurance and quality control, and problem resolution. Where appropriate, information is duplicated in both the Trial Burn Plan and QAPP. The reader, however, is asked to refer to both documents to obtain a full description of the planned test.

The permitting process will include the completion of human health and ecological risk assessments. Work plans for these assessments are also provided in the appendices.

3.0 COMPLIANCE STRATEGY

The BIF Rule requires compliance with four emission standards, as described in 40 CFR 266.104 through 266.107. These standards consider organic emissions, PM emissions, metal emissions, and acid gas emissions. The strategy GEPMV intends to follow to demonstrate compliance with each of the emission standards is described below. Details regarding the protocols and methods to be followed are found later in this Trial Burn Plan and the QAPP.

3.1 Organic Emission Standards (40 CFR Part 266.104)

3.1.1 DRE Standard (266.104(a))

GEPMV will select POHCs that are representative of the worst-case organic constituents in the hazardous waste fuels. Worst-case constituents are those that are defined as the most difficult to destroy during combustion. During the trial burn, GEPMV will feed and measure specified amounts of these POHCs and measure their emission rate. From the measured feed and emission rates, GEPMV will calculate a destruction and removal efficiency (DRE). If the DRE is equal to or greater than 99.99%, GEPMV will have demonstrated compliance with 40 CFR 266.104(a).

3.1.2 Carbon Monoxide Standard (266.104(b))

During all runs of the trial burn, GEPMV will measure and record the concentration of CO and oxygen (O_2) in the stack gas using the installed continuous emission monitoring system (CEMS). GEPMV will have demonstrated compliance with 40 CFR 266.104(b) if the maximum CO concentration in the stack gas is less than 100 ppmv, on a dry basis, corrected to 7% O_2, calculated as an hourly rolling average.

3.2 Particulate Matter Standard (40 CFR Part 266.105)

GEPMV intends to use an Adjusted Tier I strategy to demonstrate compliance with the emission standards for particulate matter (PM). GEPMV will measure the ash feed rate during the trial burn. If the measured feed rate of ash is less than the allowable feed rate limit for ash, GEPMV will have demonstrated compliance with 40 CFR 266.105 for PM. GEPMV will request the allowable feed rate of ash be established as a permit limit.

3.2.1 Allowable Emission Rates

The BIF Rule specifies that the PM standard is 0.08 gr/dscf @ 7 % O_2. The PM emission standard is expressed on a concentration basis rather than a facility allowable emission rate, so each boiler is subject to the same allowable emission concentration.

3.2.2 Allowable Feed Rates

Using the Adjusted Tier I strategy, the ash feed rate limit is equal to the emission concentration limit for PM expressed on a mass basis. Table 3-1 presents the derivation of the ash feed rate limit from the allowable PM emissions concentration. Table 3-1 also expresses the mass-based feed rate limit in terms of ash concentration at the maximum fuel feed rate under which GEPMV intends to operate.

Table 3-1 summarizes the calculations to derive the boiler-specific ash feed rate limit. The allowable PM emissions concentration is multiplied by the stack gas flow rate from one boiler to provide a maximum allowable ash feed rate to each boiler. The stack gas flow rate corresponds to the flow rate interpolated from a linear regression of historical stack test data at a maximum allowable (per state air permit) thermal input rate of 75 MMBtu/hr. The stack gas flow rate will be demonstrated during the Trial Burn.

3.3 Metal Emission Standards (40 CFR Part 266.106)

GEPMV intends to use an Adjusted Tier I strategy, described in 40 CFR 266.106(e), to demonstrate compliance with the emission standards for the metals regulated by the BIF Rule. The regulated metals are defined as the carcinogens arsenic, beryllium, cadmium, and chromium, and the non-carcinogens antimony, barium, lead, mercury, silver, and thallium.

Table 3-1

Ash Feed Rate Limits

Maximum Thermal Input Rate (MMBtu/hr/boiler)	75
Stack Gas Flow Rate (dscfm @ 7% O_2) At Maximum Thermal Input Rate (1)	17,550
Particulate Matter Standard (gr/dscf @ 7% O_2)	0.08
Equivalent Particulate Matter Emission Rate (g/hr/boiler)	5,459
Partitioning Factor (2)	1
Equivalent Ash Feed Rate (g/hr/boiler)	5,459
Maximum Allowable Ash Concentration (3)	0.25%

(1) The stack gas flow rate corresponds to the flow rate interpolated from a linear regression of historical stack test data for the boilers at a maximum allowable thermal input rate of 75 MMBtu/hr (state air permit limit). The stack gas flow rate will be demonstrated during the trial burn.

(2) Partitioning factor equals 1.0 for all Adjusted Tier I parameters.

(3) Feed stream concentration calculated using a maximum desired boiler feed rate of 4800 lb/hr waste fuel.

GEPMV will measure these feed rates during the trial burn. If the measured feed rates of these metals are less than their respective allowable feed rate limits, GEPMV will have demonstrated compliance with 40 CFR 266.106 for these metals. After completion of the formal risk assessment, a calculation will be performed to derive the maximum allowable feed rates that satisfy both the BIF Rule and the risk assessment constraints (See Section 6.8 for more details). GEPMV will request the allowable feed rates be established as permit limits.

3.3.1 Allowable Emission Rates

For all 10 of the BIF-Rule regulated metals, GEPMV will certify compliance using site-specific emission limits. Table 3-2 summarizes the calculations to derive the site-specific emission limit for each regulated constituent. The risk-specific dose (RSD) or reference air concentration (RAC) related to each constituent (shown in column 2) is divided by the site-specific dilution factor (as determined from the modeling, shown in column 3) to provide a maximum allowable facility emission rate. Column 8 shows that the summed carcinogenic risk requirement is met: the sum of the ratios of the maximum actual emission rate to the maximum allowable emission rate for the carcinogenic metals is less than 1.0.

The emission limits for chromium presented in Table 3-2 are based on the RSD for hexavalent chromium. The emission limit for chromium is based on the estimated speciation of hexavalent chromium from the total chromium as set forth in Table 3-3. In 40 CFR 266.106(g)(2), the BIF Rule provides that speciation is acceptable provided that the procedures in 40 CFR 266 Appendix IX are followed. As the chromium speciation option specified in 40 CFR 266.106(g)(2) is available for any "Tier" of metals implementation under the BIF Rule, the use of speciation factors shown in Table 3-3 is appropriate in this situation. Speciation data will be obtained during the trial burn.

Table 3-2

Facility Emission Limits

Constituent	RSD/RAC from BIF Rule	Dilution Factor (1)	Maximum Allowable Facility Emission Rate (2)		Carcinogenic Allocation (3)	Adjusted Max Allowable Facility Emission Rate	Carcinogenic Ratio (2)
	(μg/m³)	(μg/m³/g/sec)	(g/sec)	(g/hr)	(%)	(g/hr)	
Arsenic (As)	0.0023	0.1729	1.33E-02	47.9	6	2.9	0.06
Beryllium (Be)	0.0042	0.1729	2.43E-02	87.4	2	1.7	0.02
Cadmium (Cd)	0.0056	0.1729	3.24E-02	116.6	2	2.3	0.02
Hex Chrome (Cr+6)	0.00083	0.1729	4.80E-03	17.3	90	15.6	0.90
						sum of ratios:	1.00
Antimony (Sb)	0.3	0.1729	1.74	6,246	Not Applicable	Not Applicable	Not Applicable
Barium (Ba)	50	0.1729	289.18	1,041,064	Not Applicable	Not Applicable	Not Applicable
Lead (Pb)	0.09	0.1729	0.52	1,874	Not Applicable	Not Applicable	Not Applicable
Mercury (Hg)	0.3	0.1729	1.74	6,246	Not Applicable	Not Applicable	Not Applicable
Silver (Ag)	3.00	0.1729	17.35	62,464	Not Applicable	Not Applicable	Not Applicable
Thallium (Tl)	0.5	0.1729	2.89	10,411	Not Applicable	Not Applicable	Not Applicable
Hydrogen Chloride (HCl)	7.00	0.1729	40.49	145,769	Not Applicable	Not Applicable	Not Applicable
Chlorine (Cl_2)	0.4	0.1729	2.31	8,329	Not Applicable	Not Applicable	Not Applicable

(1) A copy of the dispersion modeling report is provided in Appendix B. The dilution factor was calculated by dividing the maximum predicted annual average concentration of 0.1262 μg/m³ by the corresponding modeled emission rate of 0.73 g/s.

(2) Does not include carcinogenic metal summed risk limit.

(3) The allocation of carcinogenic metals includes a reduction to ensure that the summed carcinogenic risk does not exceed 1.0. The carcinogenic allocation is based on historical information and anticipated future need.

Table 3-3

Chromium Emission Rates

Maximum Hex Chrome Emission Rate (1) (g/hr)	Estimated Speciation Factor (2) (g Cr+6/g Cr)	Maximum Total Chromium Emission Rate (g/hr)
15.6	0.50	31.1

(1) Maximum emission rates calculated using Adjusted Tier I, facility emission limits.

(2) Speciation of hexavalent chromium from total chromium estimated based on experience with similar BIF units and waste fuels. The speciation factor will be demonstrated during the trial burn.

3.3.2 Allowable Feed Rates

Table 3-4 presents the feed rate limits for the regulated constituents in the waste fuel. Using the Adjusted Tier I strategy, these feed rate limits are numerically equal to the emission rate limits shown in Tables 3-2 and 3-3, described above. Table 3-4 also express the mass-based feed rate limits in terms of concentration, at the maximum waste fuel feed rate under which GEPMV intends to operate.

As shown in Table 3-4, the maximum allowable metals concentrations in the feed (based on the Adjusted Tier I feed rate limits) for arsenic, beryllium, and cadmium are low. These concentrations are just slightly greater than the typical laboratory method detection limit. Based on historical data, GEPMV believes these constituents are not present in the fuels at concentrations greater than the detection limit; therefore, these feed rate limits are satisfactory.

3.4 Hydrogen Chloride and Chlorine Emission Standards (40 CFR Part 266.107)

GEPMV intends to use an Adjusted Tier I strategy, described in 40 CFR 266.107(e), to demonstrate compliance with the emission standards for hydrogen chloride (HCl) and chlorine (Cl_2). GEPMV will measure the feed rate of total chlorine/chloride during the trial burn. If the measured feed rate of total chlorine/chloride is less than the allowable feed rate limit, GEPMV will have demonstrated compliance with 40 CFR 266.107. After completion of the formal risk assessment, a calculation will be performed to derive the maximum allowable feed rates that satisfy both the BIF Rule and the risk assessment constraints (See Section 6.8 for more details). GEPMV will request the allowable feed rate be established as a permit limit.

3.4.1 Allowable Emission Rates

For HCl and Cl_2, GEPMV will certify compliance using site-specific emission limits. Table 3-2 summarizes the calculations to derive site-specific emission limits for HCl and Cl_2.

Table 3-4

Proposed Feed Rates for Metals and Chlorine

Constituent	Maximum Allowable Facility Emission Rate	Partitioning Factor (1)	Maximum Allowable Facility Feed Rate	Maximum Allowable Per Boiler Feed Rate	Maximum Allowable Feed Concentration (2)	Waste Fuel Detection Limit
	(g/hr)	(g emit/g feed)	(g/hr)	(g/hr)	(mg/kg)	(mg/kg)
Arsenic (As)	2.9	1	2.9	1.4	0.66	0.3
Beryllium (Be)	1.7	1	1.7	0.9	0.40	0.1
Cadmium (Cd)	2.3	1	2.3	1.2	0.54	0.1
Total Chromium (3)	31.1	1	31.1	15.6	7.14	0.1
Antimony (Sb)	6,246	1	6,246	3,123	1,434	0.3
Barium (Ba)	1,041,064	1	1,041,064	520,532	239,076	0.1
Lead (Pb)	1,874	1	1,874	937	430	0.2
Mercury (Hg)	6,246	1	6,246	3,123	1,434	0.02
Silver (Ag)	62,464	1	62,464	31,232	14,345	0.1
Thallium (Tl)	10,411	1	10,411	5,206	2,391	0.4
Total Chlorine/Chloride (4)	8,329	1	8,329	4,165	1,913	500

(1) Partitioning factor equals 1.0 for all Adjusted Tier I parameters.

(2) Feed stream concentration calculated using a maximum desired waste fuel feed rate of 4800 lb/hr/boiler.

(3) Total chromium feed rates shown in this row account for the speciation of hexavalent chromium from total chromium in the emissions.

(4) The feed rate limit for total chlorine/chloride is numerically equal to the emission rate limit for Cl_2.

3.4.2 Allowable Feed Rates

Table 3-4 presents the feed rate limits for the regulated constituents in the waste fuel. Using the Adjusted Tier I strategy, the feed rate limit for total chlorine/chloride is numerically equal to the emission rate limit for Cl_2 shown in Table 3-2. The allowable feed rate for total chlorine/chloride is set at the Cl_2 emission standard because it is lower (and, therefore, more conservative) than the HCl emission standard. Table 3-4 also expresses the mass-based feed rate limits in terms of concentration, at the maximum waste fuel feed rate under which GEPMV intends to operate.

4.0 DESCRIPTION OF FEED STREAMS

This section describes the feed streams to the BIF Rule-regulated boilers. A description of the hazardous and non-hazardous feed streams is provided in Section 4.1. The hazardous organic constituents (HOCs) listed in 40 CFR Part 261 Appendix VIII and nonhazardous constituents expected in the waste fuel feed stream are identified in Section 4.1.2. During the trial burn, GEPMV will perform testing to demonstrate acceptable DRE. The selection of POHCs to demonstrate system performance during the DRE trial burn is presented in Section 4.2. In addition, ash will be spiked during appropriate runs to demonstrate compliance with the PM emissions standard; the spiking material selected is presented in Section 4.3. Material handling and spiking procedures for all spiking solutions are documented in Section 4.4. Section 4.5 provides the basis for calculating the spiking feed rates.

4.1 Feed Streams

The two boiler feed streams at the Mt. Vernon facility are discussed in the following subsections. The feed streams include natural gas and a liquid hazardous waste fuel. GEPMV fires the boilers either entirely with natural gas or with a combination of natural gas and waste fuel. Storage and delivery of these materials to the BIF units are described in Section 5.

4.1.1 Natural Gas

Natural gas is supplied to the boilers for pilot flame light-off, boiler main flame, maintaining combustion chamber temperature when operating at low waste fuel feed rates, combustion load trim-out, or sole fuel source needs. The natural gas is supplied by the local utility company to the boilers in the gas phase, under pressure. The natural gas has an approximate heating value of 1,000 Btu/ft^3. No sampling or analysis of the natural gas for BIF Rule regulated constituents has been conducted. Given the source and normal composition of natural gas, GEPMV believes that the natural gas supplied to the boilers does not contain detectable levels of metals, chlorine, or ash.

4.1.2 Hazardous Waste Fuel

The Mt. Vernon facility feeds one type of liquid hazardous waste fuel to the boilers. The fuel is a combination of five hazardous and one non-hazardous waste streams. The hazardous waste streams include a phenol distillation bottom stream, a distillate stream, and three ignitable (D001) streams. The phenol distillation bottom stream is a process-listed hazardous waste (K022), and the distillate stream exhibits the 40 CFR 261 characteristics of toxicity for benzene (D018). The combined waste fuel fed to the boilers is designated K022, D001 and D018 because the non-hazardous and hazardous streams are mixed in tanks prior to being fed to the boilers. If and when GEPMV burns only waste fuel that is not a RCRA hazardous waste and is not mixed with hazardous waste, that activity would not be regulated by the BIF Rule and accordingly would not covered by the RCRA operating permit.

The waste fuel comes from several sources of the phenol and BPA processes:

- C520: Phenol manufacturing distillation cracker bottoms (K022),
- C540: Heavy end cracking by-product light overheads (D018),
- C420: Alpha-methyl styrene (AMS) distillation column bottoms (D001),
- C550: Acetophenone distillation column bottoms (D001),
- D645: Oil purge from dephenylation (D001), and
- Bis-phenol-A (BPA) manufacturing distillation tars (non-hazardous).

The GEPMV facility stores the waste fuel in Tanks V525A and V525B prior to being fed to the plant's BIF units for energy recovery. The waste fuel is burned as-generated, without blending individual waste streams to specific ratios. Although the waste fuel can vary in composition, the variations are relatively small since the processes producing the wastes, to meet product specifications, do not vary significantly.

The waste fuel has been analyzed for the 10 BIF metals, total chlorine/chloride, ash, organics, and heat content. Table 4-1 summarizes the results of the waste fuel analyses.

GEPMV has historical data regarding the viscosity of the waste fuel. The fuel is a viscous liquid at ambient temperatures, with a consistency similar to latex paint. The average waste fuel viscosity is 100 cP at 250°F. The waste fuel is maintained between 250 and 275°F so that it can be pumped and fired through the burners.

Several HOCs can be expected to be present in the waste fuel based on analytical testing and process knowledge. These HOCs are listed in Table 4-2. A more detailed review of the HOCs reasonably expected in the waste fuel is provided in Appendix C. Based on process knowledge, the remaining nonmetal compounds listed in 40 CFR 261, Appendix VIII could not reasonably be expected to be present in the waste fuel.

4.2 Selection of Principal Organic Hazardous Constituents

GEPMV will perform testing to demonstrate acceptable DRE. As required in 40 CFR 270.66(e), POHCs must be designated for a DRE trial burn and a DRE of at least 99.99% for these compounds must be demonstrated. The chemicals that may be considered as potential POHCs are listed as HOCs in 40 CFR Part 261 Appendix VIII. U.S. EPA guidance for hazardous waste incineration provides a method for the selection of POHCs already in the waste fuel for DRE testing. This procedure involves ranking organic compounds that are present in the waste fuel at concentrations greater than 100 ppm, in terms of their relative ease of destruction. If no such suitable POHCs are identified, surrogate POHCs must be selected and spiked into the waste fuel prior to burning.

U.S. EPA currently accepts two methods for ranking hazardous organic compounds as POHCs: the heat of combustion index method and the thermal stability at low oxygen index method. In addition to the two rankings, practical constraints must be considered in the selection of POHCs for trial burn DRE testing.

Table 4-1

Waste Fuel Analytical Results[a]

Category	Constituent	Units	Waste Fuel		
			Average	Minimum	Maximum
Physical/Chemical	Heat Content	Btu/lb	15,598	14,950	16,500
	Ash	%w/w	0.047	0.013	0.69
Metals and Chlorine	Antimony	ppm	0.3	0.1	0.5
	Arsenic	ppm	0.3	0.026	0.3
	Barium	ppm	0.17	0.1	0.8
	Beryllium	ppm	0.1	0.01	0.2
	Cadmium	ppm	0.12	0.1	0.3
	Chromium	ppm	0.5	0.027	2.7
	Lead	ppm	0.44	0.183	4.2
	Mercury	ppm	0.03	0.004	0.6
	Silver	ppm	0.1	0.1	0.3
	Thallium	ppm	0.4	0.4	1.0
	Total Chlorine/Chloride	ppm	659	400	1,000
Volatile Organics	Benzene	ppm	64	52	76
	2-Butanone (MEK)	ppm	11	4.3	18
	4-Methyl-2-Pentanone (MIBK)	ppm	36	19	53
	2-Hexanone	ppm	20	9.2	30
	Styrene	ppm	13	9.9	16
	Toluene	ppm	1,300	1,000	8,000
	Total Xylenes	ppm	2,000	1,600	2,400
Semivolatile Organics	Acetophenone[b]	ppm	160,000	100,000	250,000
	Phenol	ppm	21,000	21,000	22,000
	2-Methylphenol (o-Cresol)	ppm	100	88	110
	2,4-Dimethylphenol	ppm	80	ND	160
	Benzoic Acid	ppm	920	890	950
	Pyrene	ppm	225	225	450
General Categories	Aromatic Hydrocarbons	ppm	300	200	500
	Alkyl Phenol	ppm	360	600	7000
	Alkyl Naphthalene	ppm	300	200	400
	Oxygenated Hydrocarbons	ppm	1,300	200	400
	Polyaromatic Hydrocarbons	ppm	6,500	600	7,000
	Aromatic Amine	ppm	400	300	500

NA – Not Analyzed

[a] Organics data presented are based on samples collected in 1997 and 1998. Data for metals and total chlorine/chloride are the average of batch samples collected between 6/2/99 and 5/29/00. Heat content data from historical stack tests.

[b] Concentrations are based on process knowledge.

Table 4-2

Ranking of Hazardous Organic Compounds Considered as Potential POHCs

Constituent	Concentration in Waste Fuel[a] (ppm)	Heat of Combustion Index Ranking		Thermal Stability Index Ranking		Basis for Selection/ Rejection as a POHC
		Heat of Combustion (K cal/gram)	Overall Rank	Class	Overall Rank	
HOCs Reasonably Expected in the Waste Fuel						
Acetophenone[b]	160,000	8.26	241	3	86-90	Ranked below proposed POHCs
Benzene	64	10.03	282	1	3	Possible PIC; low on HoC list
2-Butanone	11	8.07	237	3	118-119	Ranked below proposed POHCs
2-Methylphenol (o-Cresol)	99	8.18	239	3	115	Ranked below proposed POHCs
2,4-Dimethylphenol	80	8.51	247	3	127	Ranked below proposed POHCs
Phenol (selected POHC)	21,000	7.78	225	3	86-90	Major constituent of waste fuel; ranked lowest on HoC list of native HOCs.
Toluene	1,300	10.14	283	2	38	Ranked below proposed POHCs
Surrogate POHCs						
Formaldehyde (VOC)	Negligible	4.47	115	2	39	High on HoC list
Naphthalene (SVOC)	Negligible	9.62	281	1	28	Class 1 TSI

[a] Unless otherwise noted, waste fuel concentrations presented are the average of samples collected during 1997 and 1998.
[b] Concentrations for constituents marked with footnote are estimates, based on process knowledge.

The selected POHCs must:

- Be measurable by reliable and conventional techniques;
- Not be products of incomplete combustion (PICs) of the natural gas, the waste fuel, or other POHCs;
- Be compatible with the operation of the facility;
- Have the capability to be accurately fed and metered;
- Be safe to handle; and
- Be available in quantity at reasonable cost.

An additional consideration was not to unnecessarily introduce chlorine to the waste fuel during the trial burn, since the waste fuel has non-detect levels of chlorinated hydrocarbons.

One of the HOCs reasonably expected to be in the waste fuel meets these practical constraints. In addition, GEPMV has selected two other surrogate POHCs to spike into the waste fuel feed. GEPMV proposes to select the following three POHCs for this trial burn: phenol, naphthalene, and formaldehyde. Phenol is present at high concentrations in the waste fuel and ranks the highest on the Heat of Combustion Index of the organic compounds detected in the waste fuel. Formaldehyde is a volatile organic compound (VOC) that ranks high on the Heat of Combustion Index (with a low heat of combustion value), and naphthalene is a semivolatile organic compound (SVOC) ranking high on the Thermal Stability Index. The surrogate POHCs that have been selected are representative of the types of organic constituents present in the waste fuel, and they are at least as difficult to destroy as the other organic constituents reasonably expected in the waste fuel. Table 4-2 presents a ranking of HOCs in the waste fuel and the selected POHCs using both index methods. The two index methods and the basis for selection of these POHCs are detailed in the following sections.

4.2.1 Heat of Combustion Index Method (Formaldehyde and Phenol)

The heat of combustion index method for ranking HOCs as POHCs assumes that the primary limitation on destruction of a constituent is the amount of energy necessary to complete the combustion process. This index method assumes that compounds that have low heat of combustion values are less capable of supporting combustion than compounds that have high heat of combustion values. The method is described in detail in the Guidance Manual for Hazardous Waste Incinerator Permits (U.S. EPA, July 1983).

GEPMV proposes formaldehyde as a POHC because it ranks high on the Heat of Combustion Index and it is representative of oxygenated hydrocarbons detected in the waste fuel. Formaldehyde is proposed because it has a low heat of combustion value (4.47 Kcal/gram), lower than any other HOC that is reasonably expected in the waste fuel. It also meets the practical constraints listed in Section 4.2 and is a VOC. Since formaldehyde is not expected to be present in the waste fuel, an aqueous solution of formaldehyde will be spiked into the boilers during the Trial Burn.

GEPMV proposes phenol as a POHC because it is present at high concentrations in the waste fuel and ranks the highest on the Heat of Combustion Index of the organic compounds detected in the waste fuel. Since phenol is present at high concentrations in the waste fuel, it will not be spiked into the waste fuel feed. Phenol is a SVOC.

4.2.2 Thermal Stability Index Method (Naphthalene)

The thermal stability index method for ranking HOCs as POHCs is based on a study from the University of Dayton Research Institute, which has resulted in a ranking of the incinerability of HOCs listed in 40 CFR Part 261, Appendix VIII. This ranking is based on gas-phase thermal stability at low oxygen conditions. The most stable constituents are considered to be the most difficult to destroy. The list has been divided into seven classes. Each compound is individually ranked and is also placed in one of seven classes with Class 1 compounds being the most difficult to destroy (compounds within each class are considered comparably difficult to destroy).

GEPMV proposes naphthalene as a POHC because it is a Class 1 compound and it is representative of polyaromatic hydrocarbons detected in the waste fuel. In addition, naphthalene is a SVOC. Benzene is ranked ahead of the proposed POHC within the Class 1 compounds but is not recommended as a POHC. Benzene is not recommended since it is a common product of incomplete combustion. Naphthalene also ranks ahead of benzene on the Heat of Combustion Index. GEPMV notes that because naphthalene is a solid at ambient temperatures, it will be dissolved in toluene for pumping into the waste fuel feed line. This naphthalene/toluene solution will also be relatively easy to handle, is readily available, and does not pose compatibility problems with one another or with the other compounds present in the waste fuel.

4.3 Ash Spiking

GEPMV will increase the feed rate of ash in the waste fuel by spiking this material during specific test runs. GEPMV has selected titanium dioxide for use as the ash spiking material for the trial burn. Titanium dioxide is an inert inorganic solid and is available at particle sizes less than 1.0 microns. Chromium emissions samples will not be collected when spiking ash due to concern regarding reduced chromium emissions from increased ash content in the boiler.

4.4 Material Handling and Spiking Procedures

The spiking materials will be shipped to the facility in sealed containers accompanied by certificates of analysis (COAs) and stored in a secure area. Confirmed suppliers for spiking materials to be used during this trial burn have not yet been identified.

The spiking solutions will be metered into the waste fuel feed line by individual feed systems. Each system includes a variable speed pump, mass-flow meter and closed loop controller to monitor, control and record the feed rate of the solution. Dedicated technicians will operate the spiking systems so that the proper amounts of material are added.

The spiking solutions will be introduced to the waste fuel feed line downstream of the boiler feed pump and just before the waste fuel flow meter. This location is close to the point where waste fuel enters the burner, so the possibility of precipitation, phase separation or reaction in the feed line is minimized. Waste fuel feed rates during spiking runs will be corrected for the spiking solution contribution.

In addition, the spiking input location is between the dual automatic waste feed cut-off (AWFCO) valves. In the event of an AWFCO during the trial burn, the control room operators will notify the spiking system technicians to stop the system to prevent any spiking material from building up in the feed line.

Spiking into the waste fuel feed line will begin at least 30 minutes prior to the run start time. This preliminary spiking period will ensure that the spiked materials have been processed through the entire system from the spiking location to the stack sampling location.

Any deviations from the planned spiking procedures will be fully documented in the Trial Burn Report.

4.5 Calculation of Spiking Feed Rates

GEPMV will increase the feed rates of POHCs and ash in the waste fuel by spiking these materials during specific test conditions. The basis for calculating the amount of spiked constituent to be added to the hazardous waste is provided below. The typical concentrations in the fuel and the desired total feed rates and concentrations are shown in Table 4-3.

Table 4-3

Spiking Materials and Feed Rates

Constituent	Waste Fuel Feed Rate (lb/hr/boiler)	Typical Concentration[a] (mg/kg)	Typical Feed Rate[b] (g/hr/boiler)	Target Feed Rate[c] (g/hr/boiler)	Test Condition
Phenol	4,800	21,000	45,723	Actual feed rate	2
Formaldehyde	4,800	Negligible	Negligible	167	2
Naphthalene	4,800	Negligible	Negligible	14,160	2
Ash	4,800	470	1,023	4,600	1

[a] The typical concentration is the normal concentration in fuel streams over the last several years.

[b] The typical feed rate is the typical concentration expressed as a mass feed rate, using the waste fuel feed rate listed.

[c] The maximum spiking feed rate is equal to the target feed rate. The actual spiking feed rate will be calculated as the mass needed to supply the difference between the target feed rate and the actual feed rate determined from the actual fuel concentrations on the day of the test run. The target feed rate is for the noted constituent only; the total mass spiked depends on the constituent concentration in the spiking solution. Phenol will not be spiked. The target ash feed rate is set at the maximum level expected and below the Adjusted Tier 1 feed rate limit.

4.5.1 POHC Spiking

Since the surrogate POHCs, formaldehyde and naphthalene, have low or negligible concentrations in the waste fuel, the feed rate of these POHCs will be supplemented by spiking these materials during specific test conditions. The concentrations of the POHCs in the waste fuel may be below detection limits, so the amount of POHC spiked will be set at the target POHC feed rate. The target feed rates for POHCs were developed by evaluating the method detection limits for the volatile and semivolatile organic stack sampling trains and the required minimum DRE (99.99%). The DRE for each POHC is calculated by the following equation:

$$DRE = \frac{(W_{in} - W_{out})}{W_{in}} \times 100\%$$

where:

DRE	=	Destruction and Removal Efficiency (%)
W_{in}	=	POHC feed rate to the boiler (lbs/hr)
W_{out}	=	POHC emission rate from the stack (lbs/hr).

For a DRE of 99.99% and the emission rate based on the method detection limit, the feed rate of the POHC materials can be calculated as follows:

$$W_{in} = \frac{W_{out}}{0.0001}$$

During each appropriate test run, integrated samples of the stack gases will be collected by organic constituent sampling trains including the aldehyde/ketone train and the semivolatile or Modified Method 5 sampling train (SVOST). The target emission rate (W_{out}) was selected to be at least 10 times the method detection limit for a POHC to ensure that each POHC will be measured in the emissions. This factor of 10 times the detection limit is recommended by EPA guidance is termed the safety factor.

4.5.2 Ash Spiking

For test planning purposes, the waste fuel is expected to have non-detect concentrations of ash. In this case, the spiking rate will equal the target feed rate. The target ash feed rate is set at 4,600 g/hr, which is the maximum expected feed rate and below the allowable ash feed rate of 5,459 g/hr/boiler. Actual spiking rates during the trial burn will be adjusted as necessary based on the analysis of each batch of waste fuel used during the trial burn. Table 4-3 provides historical analytical results for ash concentrations in the hazardous waste. The natural gas feed is assumed to have a negligible amount of ash.

5.0 ENGINEERING DESCRIPTION

This section provides a technical description of the boilers, as well as the associated waste fuel delivery systems, auxiliary equipment, pollution controls, exhaust stack, AWFCO system, and instrumentation associated with the combustion of hazardous waste. Figure 5-1 provides a process flow diagram of the boilers. In addition to the text description of the boilers and the associated systems, equipment and instrument specifications and engineering drawings are provided in Appendices D and E of this Trial Burn Plan. The reader is encouraged to review these appendices in their entirety for an overview of the boilers. Information in this section and the appendices describe how the boilers are physically identical.

5.1 Description of the Combustion Unit

GEPMV operates eleven boilers at the Mt. Vernon plant for steam generation. Two of these boilers, designated as Units H530A and H530B, burn hazardous waste fuel generated on-site. Boiler H530A was constructed in 1980, and Boiler H530B was constructed in 1982. Both units typically operate at the same time. Boilers H530A and H530B are maintained similarly.

The boilers are identical Babcock & Wilcox Model 103-88 D-type water tube, FM package boilers. Figure 5-2 provides a schematic diagram for the boilers. Mechanical drawings of the boilers are provided in Appendix E. The boiler shell is constructed of carbon steel and the interior wall is lined with firebrick and 88 water tubes. The water tubes are of membrane construction. The total volume of the combustion chamber is 1,315 ft^3. The boilers each contain 907 ft^2 of furnace section and 5,678 ft^2 of convection section heat transfer area for a total of 6,585 ft^2 heat transfer surface. The boilers are oriented horizontally, with approximately square cross-sections.

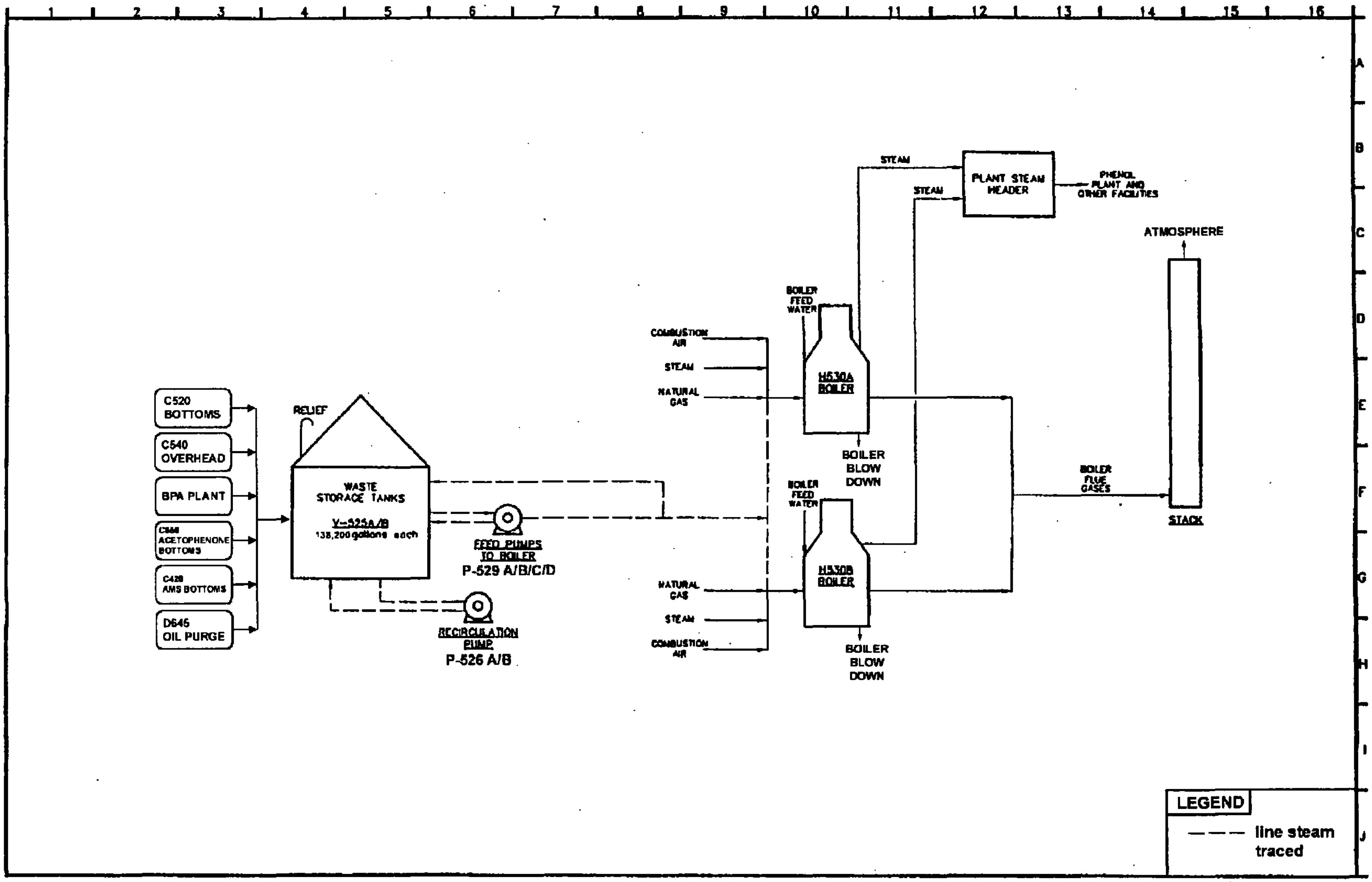


Figure 5-1. Process Flow Diagram for the Boilers

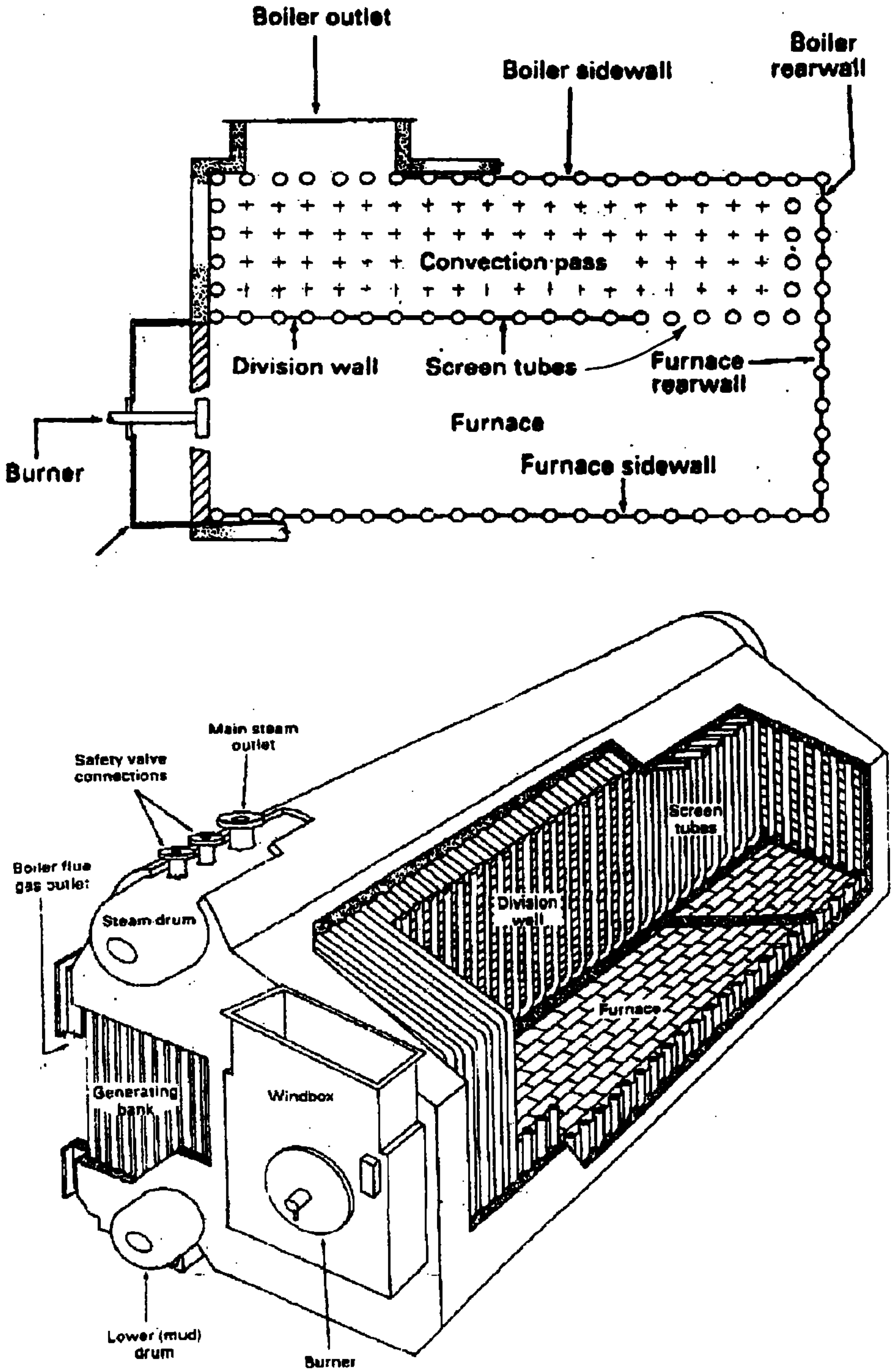


Figure 5-2. Schematic Diagram

The design steam production capacity is 70,000 pounds of saturated steam per hour at a maximum allowable working pressure of 250 psig. Boilers H530A and H530B supply steam to the medium pressure header within the Phenol Plant; excess steam feeds the medium pressure header within the entire GEPMV facility. The average pressure in the medium steam header is 174 psig. Nine of the eleven boilers at the plant, including the two BIF units, are typically base-loaded. These boilers are set at a fixed steam generation rate for a period of time. The steam generation rate for the other two boilers varies to accommodate changes in the plant's steam demand. Table 5-1 provides design specifications for the BIF boilers.

During normal operations, the feed rate of boiler feed water is controlled by a feedback control loop that monitors the water level in the steam drum. The temperature of the boiler feed water is also monitored and averages 255°F. Approximately 1% of the boiler feed water is continuously blown-down to ensure the condensate conductivity remains within specifications. The boilers do not have any blow-off requirements.

Natural gas and waste fuel are metered to the boilers by independent, calibrated meters and are horizontally-fired into the combustion zone. Flue gases from each boiler pass through boiler-specific ductwork and are exhausted via a common stack to the atmosphere. The nominal combustion gas flow rate at a thermal input rate of 75 MMBtu/hr is approximately 17,000 dscfm. Boilers H530A and H530B have a nominal residence time of approximately 3 seconds. The boilers do not have air pollution control systems.

5.2 Nozzle and Burner Design

Boilers H530A and H530B fire either natural gas or a combination of natural gas and waste fuel. Waste fuel typically makes up 90 to 95% of the total heat input to each boiler with natural gas burned for supplemental heat. During normal operations, the weight ratio of natural gas to waste fuel feed is set based on the inventory of waste fuel and the minimum thermal input rate required by the boilers to meet their target steam generation rates.

Table 5-1

Design Specifications for BIF Boilers

Parameter	Boilers H530A and H530B
Boiler Manufacturer	Babcock and Wilcox
Boiler Model	103-88
Boiler Type	D-type Water Tube
Burner Manufacturer	Babcock and Wilcox
Maximum Thermal Input	75 MMBtu/hr natural gas
Maximum Firing Rate	75,000 ft^3/hr natural gas 4,800 lb/hr waste fuel
Maximum Steam Production Rate	70,000 lb/hr @ 250 psig
Furnace Volume	1,315 ft^3
Net Heat Transfer Area	6,585 ft^2
Boiler Dimensions (approximate)	11' 9" width 13' 8 15/16" height 26' 10 ½ " length
Refractory	Firebrick
Sootblowing	Yes
Air Pollution Control	None
Stack Dimensions	118.5 feet above ground surface 59.6 inches inner diameter at stack outlet

The burner is a Babcock and Wilcox Model No. STS-22. The fuels are fired into the combustion chamber horizontally from the windbox end of the furnace. The main and pilot flames are monitored by an infrared flame scanner system. These scanners are part of the flame safety management system (Fire-Eye System FP-4) for the boilers.

The natural gas burner has a capacity of 75,000 ft^3/hr for each boiler. Natural gas has an approximate heating value of 1,000 Btu/ft^3. Natural gas is distributed in eight natural gas spuds located around the outside of the waste fuel spray burner gun.

The waste fuel burner has a capacity of approximately 4,800 lb/hr for each boiler. The burner has eight exit holes. Medium pressure steam atomizes the waste fuel into small droplets as it enters the combustion zone. Pressure switches maintain the proper atomizing steam pressure range or initiate an AWFCO. According to the historical compliance test data, the average heating value of the waste fuel was 15,598 Btu/lb.

5.3 Waste Fuel Feed System Description

Boilers H530A and H530B are both capable of burning the waste fuel. A description of this pumpable, liquid waste fuel is provided in Section 4.1.2.

5.3.1 Batch Accumulation

With the exception of the D-645 oil purge, the waste fuel streams are continuously fed to one of two API storage tanks. During normal operations, GEPMV accumulates and feeds these waste fuel streams to the boilers on a batch basis. The two storage tanks are designated V-525A and V-525B and each has a storage capacity of 138,200 gallons. One tank at a time receives and accumulates as a batch all waste fuel generated by the facility, while the second tank serves as a boiler feed tank. The accumulation of a batch in either Tank V-525A and V-525B typically requires four to six days. The storage tanks are continuously recirculated to maintain flowability, prevent solidification of the waste fuel, and maintain a consistent mixture.

Depending upon tank levels and waste fuel generation rates, one of three sampling plans is selected for sampling a tank. The three sampling plans are discussed in Section C-2d, Frequency of Analysis, of the RCRA Permit Application.

5.3.2 Delivery to Boiler

These waste fuel feed pumps are located outside on a concrete pad. The piping that extends between the pumps and boilers is aboveground and has welded, screwed, and/or welded-flange connections. The piping and tanks are inspected daily, which is documented on the Boiler Inspection Form; a copy of the inspection form is provided in Appendix F-3 of the RCRA Permit Application.

While a batch accumulates in Tank V-525A, Pump P-526A recirculates the waste fuel in the tank. Pumps P-529A and P-529B also recirculate the waste fuel in Tank V-525A, but a portion of the pump discharge is routed to the boilers. Tank V-525B and Pumps P-526B, P-529C and P-529D are paired in the same manner as described above. The recirculation and feed lines are steam-traced to maintain the waste fuel at elevated temperatures.

The waste fuel feed system includes a common feed line from each waste fuel storage tank to the boiler area. A back pressure control system maintains constant feed pressure on the system. Individual feed lines with control valves and mass flow meters come off the common feed line to each boiler. The meter transmits a signal to the distributive control system (DCS) that adjusts the flow valve automatically to maintain the feed rate set by the system operator. Dual isolation valves (spring loaded to fail close) are located in each boiler's waste fuel feed line for AWFCO. The mass flow meters are installed between these valves. During the trial burn, GEPMV will target a waste fuel feed rate limit of 4,800 lb/hr per boiler.

5.3.3 Waste Fuel Temperature

The majority of the streams that make up the waste fuel originate in the manufacturing process as distillation column bottom streams. These streams may be as hot as 600°F at their point of origin. Depending on ambient temperatures, production rate, and residence time in the storage tanks, the temperature of the waste fuel as fed to the boilers is typically between 250 and 275°F. Waste fuel is continuously recirculated through steam-traced lines to maintain its flowability and prevent solidification so it can be pumped and fired through the burners.

Thermocouples, located between the flow control valve and AWFCO valve on each boiler's feed line, monitor the waste fuel temperature. The temperature switches maintain the waste fuel between 250 and 275°F. An AWFCO is initiated if the waste fuel temperature, as fed to the boiler, is outside of this range.

As mentioned in Section 4 of this Trial Burn Plan, GEPMV has historical data regarding the viscosity of the waste fuel. At normal feed temperatures, the waste fuel is a pumpable liquid with a viscosity of 100 cP.

5.3.4 Tank System Venting

The waste fuel storage tanks are equipped with conservation vents. The head or freeboard space in each tank is nitrogen blanketed to prevent ignition of fumes from the heated waste fuel and to provide adequate flow and turbulence through the condensers. Both waste fuel storage tanks have a condenser, which uses vaporizing ammonia to condense organic vapors from the nitrogen stream. Condensed organic vapors are returned to the waste fuel storage tank and nitrogen is vented to the atmosphere.

5.4 Natural Gas Feed System Description

At the GEPMV facility, natural gas is used by Boilers H530A and H530B for a variety of purposes including:

- Pilot flame light-off;
- Boiler main flame;
- Combustion load trim out;
- Combustion temperature maintenance at low waste fuel feed rates; and
- Sole fuel source needs.

GEPMV purchases natural gas from the local utility company. The gas is delivered via pipeline in the gas phase under pressure. The maximum allowable thermal input of natural gas is 75 MMBtu/hr for Boilers H530A and H530B. The average natural gas feed rate ranges from 3,500 to 4,000 ft^3/hr per boiler depending on steam load and waste fuel usage.

5.5 Ash Handling System

Bottom ash is not continuously removed from the utility boilers but is cleaned out during the annual turnaround of the boilers. The ash is sent to an approved RCRA Subtitle C off-site facility for treatment and disposal.

5.6 Soot Blowing

Boilers H530A and H530B are equipped with Babcock & Wilcox soot-blowing systems to remove soot from boiler water tubes and maintain thermal efficiency. Soot blowing achieves a 1 to 2% increase in steam production efficiency. Boilers H530A and H530B each have four soot blowers. Each boiler has one soot blower on its north side and one soot blower on its south side. In addition, Boiler H530A has two soot blowers on its west side and Boiler

H530B has two soot blowers on its east side. While burning waste fuel, soot blowing is typically conducted once a day for approximately 5 minutes per unit. Soot blowing is not required during natural gas-only operations.

5.7 Prime Mover Description

A forced draft, constant speed fan is used to provide the motive force to push combustion gases through each boiler system. The installed fan on each boiler was manufactured by Chicago Blower and is powered by a 100 hp GE electric motor. The fans are each designed for a suction flow of 19,389 acfm of combustion air at 105°F and a static pressure of 20 inches water column.

The combustion gas flow rate is controlled automatically by the fan's damper system. The damper position is varied as required to maintain the set point for excess oxygen in the exhaust gas. The air flow required will vary with the fuel feed as indicated by the oxygen monitor. The damper position is monitored by the DCS.

Combustion air is continuously pre-heated by a steam air heater before it enters the boiler. The heater has four sections of fin-type coil banks and uses medium pressure saturated steam with a nominal pressure of 200 psig. A signal from the temperature transmitter downstream of the pre-heater is used to adjust the steam flow control valve. The temperature of combustion air entering the boilers is maintained at a set point of 150°F. The air preheater will not be used during the LOW test condition in order to conduct emissions testing under conservative, low temperature conditions.

5.8 Continuous Emissions Monitoring System

GEPMV has installed CEMS in the boiler-specific ductwork leading to the common stack to continuously measure CO and O_2 in the flue gas of each boiler. The CEMS are Hartmann & Braun systems. The equipment includes a sample probe located in the ductwork, a heated sample transport line, a CO/O_2 sample conditioning system for gas cooling and drying, and CO and O_2 analyzers. Table 5-2 provides specifications for the analyzers.

The dual range CO analyzer measures the stack CO concentration several times a minute. The analyzer evaluates the reading from both ranges and selects the appropriate reading. The O_2 analyzer measures the stack O_2 concentration several times a minute. The O_2 reading is used to correct the CO reading to 7% O_2 using the equation below. CO and O_2 readings correspond to dry conditions due to the gas conditioning system prior to gas analyzer.

$$\text{CO Conc. (ppmv @ 7\% } O_2\text{, dry)} = \text{CO Conc. (ppmv @ stack } O_2\text{, dry)} \times \frac{(21 - 7\%\ O_2)}{(21 - \text{stack } O_2)}$$

The process control computer polls data from the analyzer system every 15 seconds. A one-minute average CO concentration is calculated every minute from the four most recent 15-second O_2 corrected readings. At each successive minute, the 60 most recent one-minute average CO concentrations are used to calculate an hourly rolling average CO concentration. The one-minute and hourly rolling average CO (O_2 corrected) concentrations and instantaneous O_2 concentrations are automatically recorded once a minute by the DCS. These data are indefinitely stored by the AIM system. If the hourly rolling average CO concentration exceeds 75 ppmv corrected to 7% O_2 (75 ppmv set point, 100 ppmv limit), then an AWFCO is initiated.

The DCS also performs the necessary calculations for reports, provides hard copy and terminal displays of data, alarms, calibrations, and other events. These analyzers were installed and certified in 1992 prior to conducting the compliance certification test program and are retested annually. These monitors are maintained and operated in accordance with the performance specifications given in 40 CFR 266 Appendix IX, Section 2, including daily, quarterly, and annual testing.

Table 5-2

Design Specifications for the Continuous Emission Monitors

Parameter	CO Analyzer	O_2 Analyzer
Manufacturer	Hartmann & Braun	Hartmann & Braun
Model Number	URAS 3G (or equivalent)	MAGNOS 6G (or equivalent)
Range	0 – 200 ppmv (low range) 0 – 3,000 ppmv (high range)	0 – 25%
Calibration Frequency	Daily	Daily
Drift (24-hr)	≤ 6 ppmv (low range) ≤ 90 ppmv (high range)	≤ 0.5%
Error	≤ 10 ppm (low range) ≤ 150 ppm (high range)	≤ 0.5%
Response Time	≤ 2 minutes	≤ 2 minutes
Accuracy	The greater of 10% of the performance test method of 10 ppmv	Incorporated into the CO RA calculation

Zero and span calibrations are performed daily by the DCS. During the calibration cycle for each boiler's CEMS, each analyzer, including the separate CO low and high ranges, is dosed with zero and span calibration gas standards. Calibration drift is calculated and compared to the analyzer's specifications. The BIF Methods Manual requires that gas analyzers exceeding their daily calibration drift be adjusted to the applicable calibration gas concentrations. CEMs may be manually calibrated if the automatic recalibration does not bring the calibration drift within specifications or if the calibration drift has exceeded the specifications a few days in a row. An AWFCO is triggered when the CO or O_2 analyzer fails a calibration drift test or when there is a system diagnostic failure.

5.9 Exhaust Stack

The stack is constructed of carbon steel. Exhaust from each boiler passes through boiler-specific ductwork to a common stack. The stack inner diameter is 95 inches at the stack sampling port and 59.6 inches at the stack outlet. The gas discharge point is 118.5 feet above ground surface.

5.10 Process Instrumentation

The BIF Rule requires continuous monitoring of several process operating conditions to verify that the boiler systems are within operating or permit limits. In addition, other operating parameters are monitored to ensure proper combustion conditions or maintain desired production rates. The DCS is used for process control, monitoring, interlocking, and data storage. The following parameters are monitored at the Mt. Vernon facility:

- Waste fuel feed rate;
- Natural gas feed rate;
- Combustion chamber temperature;
- Stack CO and O_2 concentrations.

In addition, there will be new parameters that must be monitored under a permit. These parameters include thermal input rate as a measure of production rate and combustion gas velocity. Monitoring of steam production, waste fuel feed temperature and combustion air temperature may also be required under a permit. Table 5-3 provides details about the process instrumentation. Figure 5-3 is a schematic diagram showing the location of the process instrumentation.

The waste fuel feed rate to each boiler is monitored on a continuous basis by an ABB Kent-Taylor differential pressure meter with a square root extractor. On each boiler, the meter is located between the dual fail-close AWFCO valves. The natural gas feed rate to each boiler is measured by a differential pressure orifice plate flow meter. The meter is located in the feed piping upstream of the control valve. The feed rates of the waste fuel and natural gas are used in conjunction with the heating values of the two streams to calculate the total thermal input rate to the boiler.

Each boiler firebox contains a thermocouple to measure the temperature of the combustion gas. The thermocouple in Boiler H530A is installed on the east side and the thermocouple in Boiler H530B is installed in the west side. The combustion chamber temperature is an AWFCO parameter under a RCRA permit. GEPMV will install a combustion gas velocity meter between the forced draft fan and the boiler.

Stack CO and O_2 concentrations are determined by a Hartmann & Braun CO/O_2 systems. Probes for the analyzers are located in the boiler-specific exhaust ductwork, upstream of the common stack. These analyzers are described in more detail in Section 5.8.

Steam production from each boiler is monitored by a differential pressure orifice plate flow meter. The meters are located in the steam output line from each boiler after a slipstream to the combustion air preheater and before the line joins the common steam header. Each boiler's waste fuel feed line is equipped with a thermocouple to measure the waste fuel temperature. The thermocouples are located before the flow control valve. Each boiler's

Table 5-3

Major Process Instrumentation

Parameter	Units	H-530A Fig. ID[a]	H-530A Inst. No.	H-530B Fig. ID[a]	H-530B Inst. No.	Inst. Type	Manufacturer & Model No.	Inst. Range	Calibrated Range	Accuracy	Calibration Frequency
Waste Fuel Feed Rate	lb/hr	F1	FT-5319	F2	FT-5367	Differential pressure meter	ABB 515T (or equivalent)	-150 to 150 inches H_2O	0 to 67.3 inches H_2O	±0.25% of span	Monthly
Natural Gas Flow Rate	ft^3/hr	F3	FT-5301	F4	FT-5376	Differential pressure transmitter	Rosemount 3051CD2A22A1AB4M5 (or equivalent)	0 to 250 inches H_2O	0 to 100 inches H_2O	0.10% of span	Monthly
Combustion Gas Velocity Meter	m/s	F5	TBD[b]	F6	TBD[b]	TBD[b]	TBD[b]	TBD[b]	TBD[b]	TBD[b]	TBD[b]
Combustion Temperature	°F	T1	TT-5393	T2	TT-5392	Temp. transmitter	Rosemount Model 3044C with NIST Type B Thermocouple (or equivalent)	32-3,308°F	212-2,500°F	±0.1% of span	Semi-Annually
Steam Atomization Pressure	psig	P1	PT-5333	P2	PT-5359	Pressure transmitter	Rosemount Model 1511 (or equivalent)	0-300 psig	0-300 psig	±0.1% of span	Semi-Annually
Stack CO Concentration	ppmv, dry	A1	AT-530A2	A2	AT-530B2	Non-dispersive Infra-Red (NDIR)	Hartmann & Braun Model No. URAS 3G (or equivalent)	0-200 0-3000 ppmv	0-200 0-3000 ppmv	±0.5% of span	Daily
Stack O_2 Concentration	vol. %, dry	A3	AT-530A1	A4	AT-530B1	Para-magnetic	Hartmann & Braun Model No. MAGNOS 6G (or equivalent)	0-25 vol %	0-25 vol %	±0.5 % of span	Daily

[a]Refer to Figure 5-3
[b]To be determined. A combustion gas velocity indicator (CGVI) has yet to be installed; no past operating data for combustion air flow is available. The CGVI will be installed prior to the trial burn.

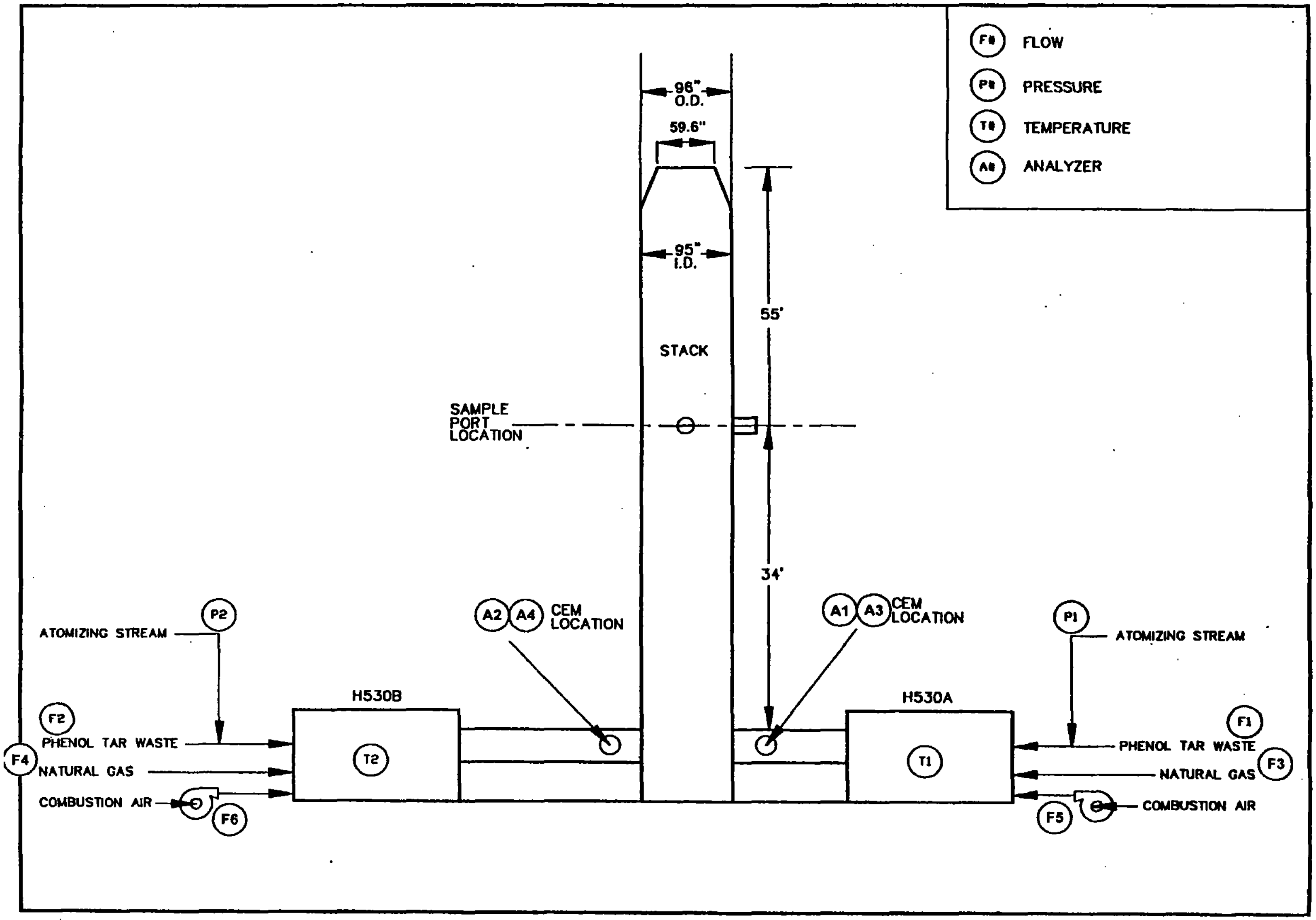


Figure 5-3. Schematic Diagram of Process Instrumentation

combustion air feed line is equipped with a thermocouple to measure combustion air temperature. The thermocouples are located between the air preheater and the boiler.

5.11 AWFCO Description

During day-to-day operations, GEPMV operates an AWFCO system to ensure compliance with all applicable operating and feed rate limit parameters. The AWFCO parameters that currently apply to the Mt. Vernon facility under interim status are:

- Maximum total hazardous waste fuel feed rate; and
- Maximum CO concentration.

The DCS polls raw data for each AWFCO parameter every 15 seconds. One-minute average values are calculated every minute from the four most recent 15-second readings. The 60 most recent one-minute averages are used to calculate an hourly rolling average value. The one-minute and hourly rolling averages are automatically recorded by the DCS. These data are indefinitely stored by the AIM system. Every minute, the hourly rolling averages are compared to their corresponding AWFCO set points. If an hourly rolling average exceeds a set point, the DCS issues a signal for the AWFCO valve to be tripped. Table 5-4 lists the current AWFCO limits from the Recertification of Compliance and the set points the plant normally sets to prevent exceedances.

An AWFCO will also be triggered if the monitoring or recording systems fail. Specifically, AWFCOs are initiated for a data recording system failure, DCS failure on the boiler control, or total DCS failure.

The waste fuel feed will automatically be shut off using dual fail-close valves whenever one of the AWFCO set points is exceeded. Each of these operating parameters will continue to be monitored during a cutoff event. The boiler is operated on natural gas until compliance is re-established or the boiler is shut down.

Table 5-4

AWFCO Parameters, Limits and Set Points

AWFCO PARAMETER	LIMIT	SET POINT
Current Operating Conditions		
Maximum total waste fuel feed rate (lb/hr)[a]	4,785 (Boiler H530A)[b] 4,794 (Boiler H530B)[b]	4,785 (Boiler H530A)[b] 4,794 (Boiler H530B)[b]
Maximum stack CO concentration (ppmv @ 7% O_2, dry)	100	75
Trial Burn Target Conditions[c]		
Maximum total waste fuel feed rate (lb/hr)[a]	4,800	4,900[d, e]
Minimum thermal input rate (MMBtu/hr)	TBD	TBD
Maximum thermal input rate (MMBtu/hr)	75	75[d, e]
Minimum combustion chamber temperature (°F)	TBD	TBD
Maximum combustion chamber temperature (°F)	TBD	TBD
Maximum combustion gas velocity or flow rate	TBD	TBD
Maximum stack CO concentration (ppmv @ 7% O_2, dry)	100	100[c]

TBD - To Be Determined

[a] At the Mt Vernon facility, the total pumpable hazardous waste fuel feed rate and the total hazardous waste fuel feed rate are the same.

[b] This operating limit will be re-established during trial burn.

[c] In addition to the BIF Rule-regulated parameters listed, additional operating limits may be imposed on the boilers based on an engineering evaluation of the system. Minimum and maximum steam production, minimum waste fuel temperature and minimum combustion air temperature are expected to be additional operating limits under a RCRA permit. The target maximum and minimum steam production rates will developed just prior to the trial burn. The target minimum waste fuel temperature will be 250°F, and the target minimum combustion air temperature will be the ambient temperature.

[d] Proposed AWFCO set points to be established during the trial burn to allow the plant to demonstrate the desired target limits. Upon completion of the trial burn testing, the setpoints will be returned to their original interim status settings.

[e] The maximum allowable thermal input rate (state air permit limit) is 75 MMBtu. Since the target waste fuel feed rate is based on the maximum thermal input rate, the set point for the waste fuel feed rate must ensure that the maximum allowable thermal input rate is not exceeded.

Once a week, the waste fuel shutoff valves on Boilers H530A and H530B are tested. The testing demonstrates that each AWFCO parameter can trigger a fuel shutoff event and that the AWFCO valve is physically shut with each trip.

During the trial burn, GEPMV will maintain an AWFCO on the CO emission concentration to ensure that the trial burn will not present a hazard to human health or the environment and an AWFCO on the maximum waste fuel feed rate to ensure the state air permit limit on thermal input rate is not exceeded. GEPMV will set the other AWFCOs at approximately 20% above the target trial burn operating conditions presented in Table 5-4 in order to allow flexibility during testing while still maintaining an operating cut-off system.

5.12 Startup and Shutdown Procedures

Detailed standard operating procedures for the startup and shutdown of the boilers are provided in Appendix F.

5.13 Fugitive Emissions and Their Control

The phenol plant has implemented an equipment leak detection and repair (LDAR) program. Applicable pumps, valves, compressors, pressure relief valves, sampling connections, and open-ended lines are monitored routinely and visually inspected for leaks. The shells of the boilers are inspected daily to ensure no leaks are present.

6.0 TEST PROTOCOLS

This section describes the design of the trial burn, including the testing requirements, units tested, test conditions and scenarios, number of runs, and parameters tested. The section also describes how GEPMV intends to develop proposed permit limits from the results of the trial burn and the risk assessment. The manner in which GEPMV intends to operate the boilers after the trial burn is also discussed.

6.1 Testing Requirements

The trial burn is designed to meet the objectives that were previously described in Sections 2 and 3 of this plan. Those objectives were developed by considering the necessary operating envelope for the boilers, the specific requirements in the BIF Rule, and recent trial burn and risk assessment guidance (*Guidance on Collection of Emissions Data to Support Site-Specific Risk Assessments at Hazardous Waste Combustion Facilities*, EPA530D-98-002, August 1998.) The objectives outlined the requirements for the testing; these requirements are discussed in more detail below.

6.1.1 Permit-Required Testing

The trial burn will be conducted to demonstrate that the boilers meet the emission standards of the BIF Rule, as described in 40 CFR 266.104 through 107. These emission standards include:

- Destruction of organic constituents, in particular, 99.99% DRE of the selected POHCs (formaldehyde, naphthalene, and phenol);
- Limitation of stack exhaust gas PM concentration to less than 0.08 grains per dry standard cubic foot at 7% O_2; and
- Limitation of stack exhaust gas CO concentration to less than 100 ppmv, corrected for moisture and adjusted to 7% O_2.

Compliance with the DRE standard will be based on calculations that are summarized in Figure 6-1. Compliance with the PM standard will be based on calculations summarized in Figure 6-3. Compliance with the CO standard will be by direct comparison of actual emission rates to the emission standard. The calculations for emission concentrations and emission rates are summarized in Figures 6-2 through 6-4.

While the boilers demonstrate compliance with these emission standards, data will be collected to generate limits that will be used in the RCRA permit. The results of the site-specific risk assessment will also be incorporated in the development of permit limits.

Ash feed rates will be compared to the corresponding PM emission rates to demonstrate that significant PM emissions are not being generated in excess of the native ash content of the waste fuel during the combustion process. Following BIF protocols for PM emissions testing, one run will include soot blowing. This run will be conducted as close as possible to the normal cleaning cycle.

In general, the permit will include limits in three categories: boiler operating limits, emission limits, and constituent feed rate limits. Boiler operating limits will include the following parameters:

- Maximum production rate (as measured by total thermal input rate to each boiler),
- Minimum production rate (as measured by total thermal input rate to each boiler),
- Maximum combustion chamber temperature (measured by a thermocouple in each boiler),
- Minimum combustion chamber temperature (measured by a thermocouple in each boiler),
- Maximum flue gas flow rate (measured by combustion gas velocity meter), and

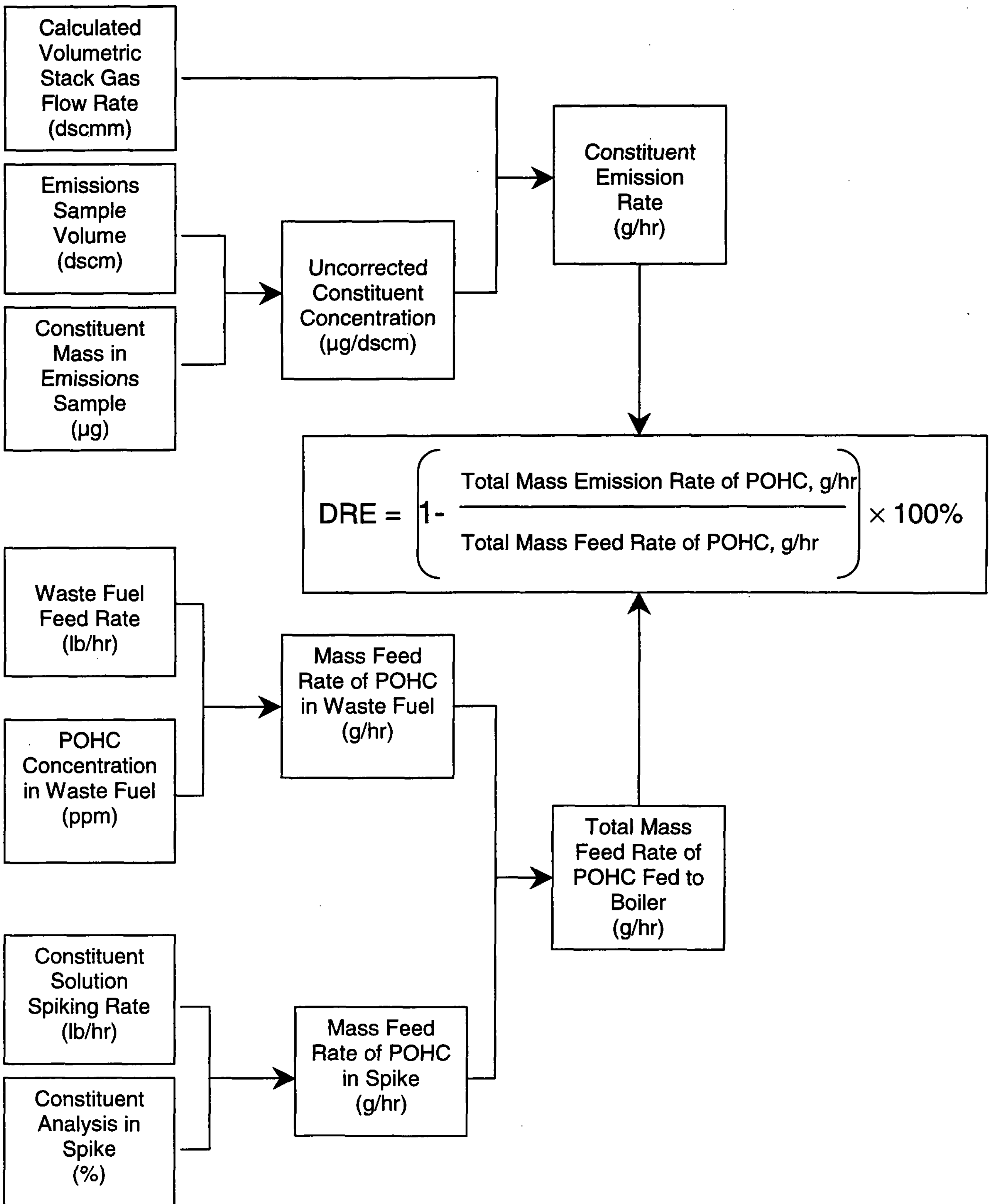


Figure 6-1. DRE Calculations

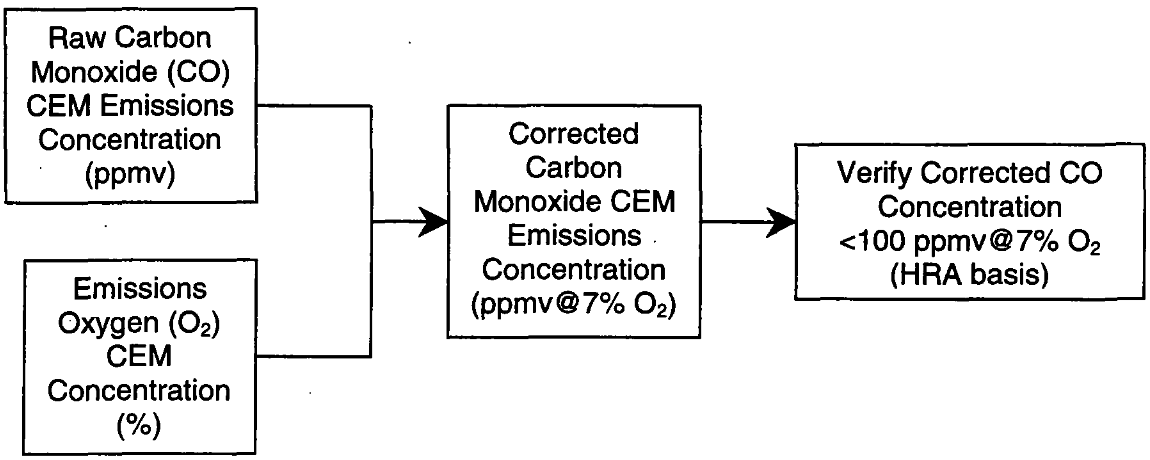
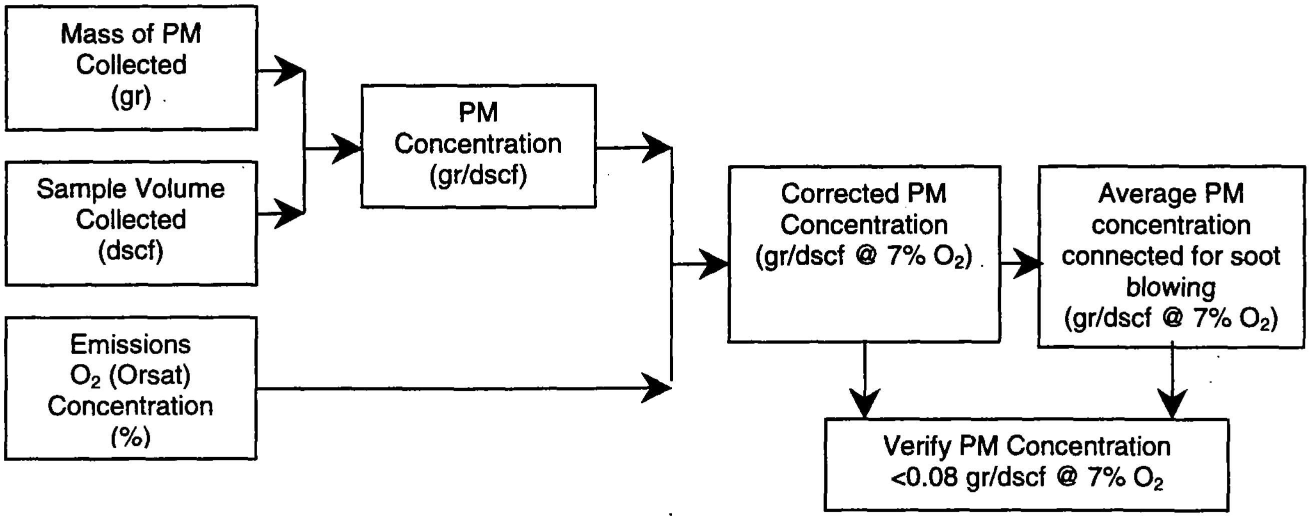


Figure 6-2. Organic Emissions (Carbon Monoxide)



Soot Blowing Correction:

$$E = (ESBR - ENOSB)\left[\frac{AS + BS}{AR}\right]\frac{Cn}{Ct} + ENOSB$$

where:

E = Average PM concentration (gr/dscf @ 7% O_2)

E_{SBR} = Average PM concentration (gr/dscf @ 7% O_2) during soot blowing runs

E_{NOSB} = Average PM concentration (gr/dscf @ 7% O_2) during non-soot blowing runs

A = Hours of soot blowing during soot blowing test runs

$= \dfrac{5\text{ minutes}}{60\text{ min/hr}} = 0.083\text{ hr}$ (example - will be updated based on actual test operations)

B = Hours not soot blowing during soot blowing test runs
= 3 hrs - 0.083 hr = 2.917 hr (example - will be updated based on actual test operations)

S = Hours normally soot blowing per day

$= \dfrac{5\text{ minutes}}{\text{day}} \times \dfrac{\text{hour}}{60\text{ minutes}} = 0.083\text{ hr}$

R = Hours boiler normally operates per day
= 24 hr/day

C_n = Hours normally between soot blows
= 24 hours

C_t = Hours between soot blows during test
= 24 hours (example - will be updated based on actual test operations)

Figure 6-3. Particulate Matter Emissions

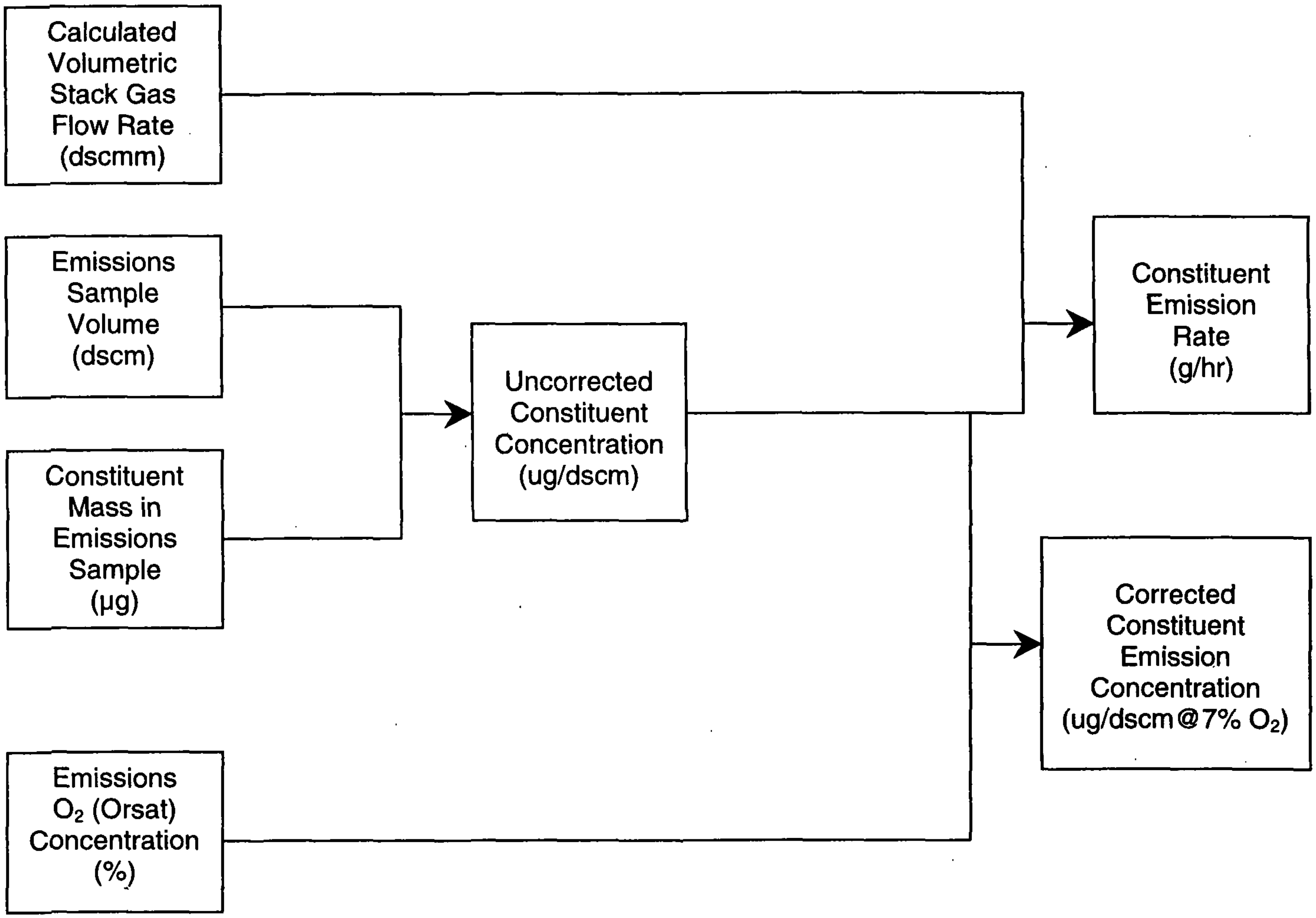


Figure 6-4. Constituent Emission Concentrations/Rates

data for the risk assessment. This testing will be described below. Work plans for the human health and ecological risk assessments are provided in Appendices G and H of this plan.

Based on process knowledge, GEPMV believes there is no possibility of the waste fuel containing PCBs. While PCBs are present at the plant, they are not used or produced in the manufacturing units that generate the waste fuel. Accordingly, GEPMV does not propose to have the stack gas analyzed for PCBs.

6.2 Units Tested

Both BIF boilers will be operated simultaneously on the waste fuel at or near target operating conditions during all test runs. Permit-required testing is typically conducted on only one boiler at a time. GEPMV decided to conduct this testing while both boilers are operating for the following reasons:

- The identical boilers share a common stack and the boiler-specific ductwork does not meet the requirements of EPA Method 1.
- Flue gas flow rate from one boiler only is expected to be low enough to require special equipment to adequately measure gas velocity.
- If only the test boiler was operated, inleakage through the non-operating boiler can influence stack gas velocities and PM emission concentrations.
- Stack testing with one boiler on natural gas and one boiler on waste fuel may introduce uncertainty to flue gas velocities when subtracting out the contribution from natural gas combustion.
- Waste fuel accumulation may exceed the available storage capacity with only one boiler operating on the fuel for several days.

If the waste fuel feed to either unit is shut off during a test run, the feed and emissions sampling will be suspended until both boilers are back on-line.

6.3 Operating Conditions

Section 3 describes the overall strategy GEPMV intends to use to demonstrate compliance with the emission standards of the BIF Rule. Worst-case emissions for the constituents regulated by these standards occur at different operating conditions. Multiple test conditions must therefore be conducted to demonstrate compliance with the standards and to provide data to establish permit limits.

Metal emissions, acid gas emissions, and PM emissions are all maximized under operating conditions consisting of a high combustion chamber temperature, high production rate, and high waste fuel feed rate. The HIGH operating condition is defined to maximize these parameters and to establish relevant limits. Table 6-1 summarizes the limits established under the HIGH operating condition.

Organic emissions are maximized under operating conditions consisting of low combustion chamber temperature, low production rate, and high waste fuel feed rates. The LOW operating condition is defined to minimize combustion chamber temperature and production rate, while maintaining a high waste fuel feed rate. Table 6-2 summarizes the limits established under the LOW operating condition.

6.4 Test Scenarios

The test matrix described in Table 6-3 was developed to satisfy the trial burn objectives and testing requirements of the BIF Rule. GEPMV developed a test matrix that combines as much testing as possible, while still providing the data needed to demonstrate compliance and establish permit conditions. Three factors were considered in developing this test matrix:

- Performing concurrent stack testing where possible, considering the physical constraints of the sampling location,

Table 6-1

Operating Limits to be Established Under the HIGH Operating Condition (per 40 CFR 266.102(e))

Operating Parameter[a]	Limit to be set	Target Limit	Applicable Standard(s)
Hazardous waste fuel feed rate	Max	4,800 lb/hr	Metals, HCl/Cl_2
Thermal input rate	Max	75 MMBtu/hr	Metals, HCl/Cl_2, PM
Combustion chamber temperature	Max	TBD	Metals
Stack gas flow rate[b]	Max	TBD	DRE

TBD - To Be Determined

[a] In addition to the BIF Rule-regulated parameters listed above, additional operating limits may be imposed on the boilers based on an engineering evaluation of the system. Maximum steam production is expected to be an additional operating limit under a RCRA permit. The target maximum steam production rate will be developed just prior to the trial burn.

[b] Parameter will be monitored during HIGH operating conditions, but limit will be based on LOW operating condition data only.

Table 6-2

Operating Limits to be Established Under the LOW Operating Condition (per 40 CFR 266.102(e))

Operating Parameter[a]	Limit to be set	Target Limit	Applicable Standard(s)
Hazardous waste fuel feed rate	Max [b]	4,800 lb/hr	DRE
Thermal input rate	Min	TBD	DRE
Combustion chamber temperature	Min	TBD	DRE
Stack gas flow rate	Max	TBD	DRE

TBD - To Be Determined

[a] In addition to the BIF Rule-regulated parameters listed above, additional operating limits may be imposed on the boilers based on an engineering evaluation of the system. Minimum steam production, minimum waste fuel temperature and minimum combustion air temperature are expected to be additional operating limits under a RCRA permit. The target minimum steam production rate will be developed just prior to the trial burn. The target minimum waste fuel temperature will be 250°F, and the target minimum combustion air temperature will be the ambient temperature.

[b] Parameter will be monitored during LOW operating conditions, but limit will be based on HIGH operating condition data only.

Table 6-3

Summary of Trial Burn Test Conditions

No. of Boilers	Test Condition	Operating Condition	Testing Day	Stack Parameters	Fuel Parameters	Spiking	Regulatory Citation	Purpose/Limit Established
2	1	HIGH	1	Metals	Metals	None	40 CFR 266.106	BIF Adj. Tier I feed rate compliance demonstration, Cr^{+6}/Cr_{tot} speciation, Risk Assessment Testing
			1	Hexavalent Chromium	Metals	None	40 CFR 266.106	Cr^{+6}/Cr_{tot} speciation, Risk Assessment Testing
			2	Dioxins/Furans	VOCs, SVOCs	None	N/A	Risk Assessment Testing
			2	HCl/Cl_2	Total Chloride	None	40 CFR 266.107	BIF Adj. Tier I feed rate compliance demonstration, Risk Assessment Testing
			2, 3	PM	Ash	Ash	40 CFR 266.105	BIF Adj. Tier I feed rate limit and PM emission compliance demonstration
			3	PM	Ash	None	N/A	Risk Assessment Testing
			3	PSD	Ash	None	N/A	Risk Assessment Testing
			1, 2, 3	CO, O_2 (CEMS)	N/A	None	40 CFR 266.104(b)	BIF CO emissions compliance demonstration
	2	LOW	4, 5	Aldehydes/ Ketones	N/A	POHC	40 CFR 266.104(a)	BIF DRE compliance demonstration
			4, 5	SVOCs	SVOCs	POHC	40 CFR 266.104(a)	BIF DRE compliance demonstration
			4, 5	CO, O_2 (CEMS)	N/A	None	40 CFR 266.104(b)	BIF CO emissions compliance demonstration

Table 6-3 (Continued)

Summary Of Trial Burn Test Conditions

No. of Boilers	Test Condition	Operating Condition	Testing Day	Stack Parameters	Fuel Parameters	Spiking	Regulatory Citation	Purpose/Limit Established
2	3	LOW	5, 6	PAHs	VOCs, SVOCs	None	N/A	Risk Assessment Testing
			5, 6	Aldehydes/ Ketones	VOCs, SVOCs	None	N/A	Risk Assessment Testing
			6, 7	VOCs	VOCs	None	N/A	Risk Assessment Testing
			6, 7	SVOCs	SVOCs	None	N/A	Risk Assessment Testing
			6, 7	TOE	VOCs, SVOCs	None	N/A	Risk Assessment Testing
			5, 6, 7	CO, O_2 (CEMS)	N/A	None	40 CFR 266.104(b)	BIF CO emissions compliance demonstration

N/A – Not Applicable

Stack Notes:

Boiler stack ports currently allow a maximum of 4 manual method trains (with staggered start).

CEM = Continuous Emission Monitor
CO = Carbon Monoxide
DRE = Destruction And Removal Efficiency
HCl/Cl_2 = Hydrogen Chloride/Chlorine
O_2 = Oxygen
PAHs = Polyaromatic Hydrocarbons
PM = Particulate Matter
PSD = Particle Size Distribution
SVOC = Semivolatile Organic Compound
TOE = Total Organic Emissions
VOC = Volatile Organic Compound

- Determining multiple parameters from individual emission samples (sampling trains) where possible, while ensuring that adequate detection levels are obtained, and

- Identifying a single worst-case scenario for risk assessment testing that would not require additional permit limits to be established.

6.4.1 Concurrent Sampling

The stack sampling arrangement consists of four ports at one elevation, with each port oriented at a 90-degree separation from the others. The arrangement allows a maximum of four isokinetic sampling trains to be used at one time, with some staggering of the individual train start and stop times. As a result, as many as four trains can be operated during each sampling run. Some of the test conditions shown in Table 6-3 require more than four sampling trains. Therefore, some of the test conditions will require more than one testing day.

6.4.2 Risk Assessment Sampling

GEPMV developed the stack testing scenarios for risk assessment sampling based on the issues described below.

Worst-Case vs. Normal Operation

Recent EPA guidance states that sampling to obtain results for use in a risk assessment can be conducted at worst-case operating conditions or at normal operating conditions. EPA considers worst-case conditions to be those that would tend to maximize emissions of a constituent, while normal conditions reflect those that are typically encountered during day-to-day operation of the device. If testing is performed at normal conditions, then additional permit limits may be required to ensure the device operates within the definition of those normal conditions over a long time period.

GEPMV desires to minimize the number of permit limits on the boilers and has therefore chosen to conduct the risk assessment under worst-case operating conditions. By doing so, GEPMV believes the emission data used for the risk assessment will conservatively overestimate normal operations. Conducting the risk assessment sampling at worst-case conditions will also allow the permit to contain only those limits that are established based on short-term operations (hourly rolling average limits for BIF Rule compliance.) Additional permit limits to ensure some definition of "normal conditions" will not be required.

Definition of Worst-Case Conditions

Worst-case conditions are those that would tend to maximize the emission rate of a constituent. Worst-case conditions are therefore constituent-dependent. The explanation of worst-case conditions for each of the major emission constituents is described separately below.

Metals

Worst-case conditions for metal emissions include the following parameters:

- High metals feed rates to maximize potential emissions;
- High chlorine feed rates to maximize metal constituent volatility;
- High combustion chamber temperatures to maximize volatility, and
- High combustion gas velocities (low residence time) to minimize settling out or precipitation.

GEPMV will therefore use the metal emission results from the BIF Rule-required testing at the HIGH condition for the risk assessment. The HIGH condition represents the worst-case levels of the parameters discussed above. Under these conditions, chromium and chlorine feed rates will be maximized through high waste fuel feed rates (high metals and chlorine concentrations at maximum target levels) and the boiler will be operated at high temperature and high combustion gas velocity.

Dioxins and Furans

EPA believes that the formation of dioxins and furans in combustion devices is a complex situation and several, sometimes conflicting, parameters may each be influential in maximizing emissions of these constituents. For example, low combustion temperatures may minimize combustion efficiency to allow more, and larger, organic precursors to survive and contribute to dioxin and furan emissions. High combustion temperatures may provide the correct temperature-window to exist in an air pollution control device that is favorable to dioxin/furan formation reactions. High chlorine feed rates at various operating conditions may tend to provide more chlorine to aid the formation of dioxins and furans.

GEPMV believes that the HIGH operating condition is more likely to contribute to worst-case dioxin and furan emissions and will conduct the testing for the risk assessment at that condition. The HIGH condition will have stack temperatures in the temperature window for dioxin/furan formation reactions while the LOW condition may not. In addition, the chlorine feed rate should be higher during the HIGH condition.

Non-dioxins PICs

Worst-case conditions for the emission of organic constituents other than dioxins and furans are generally thought to include:

- High feed rate of total organics,
- High feed rate of difficult to destroy organics, and
- Poor combustion efficiency, resulting from low temperature, little mixing or low residence time.

Poor combustion efficiency may be caused by low temperature and less mixing associated with the LOW operating condition, and by the reduced residence time associated with the HIGH operating condition. Of these two, the LOW operating condition appears to be worse, considering the lower temperatures, the significantly higher percentage of liquid to total fuel used, and the reduced mixing. GEPMV therefore believes that the LOW operating condition is more likely to contribute to poor combustion and will conduct the testing for the risk assessment at that condition.

6.5 Number and Length of Individual Sampling Runs

During each condition, three separate, replicate, sampling runs will be conducted for each emission constituent. In addition, a fourth replicate sampling run will be conducted per condition for emission constituents associated with BIF Rule compliance (e.g., DRE demonstration). Samples will be collected during these contingency runs, but will only be analyzed in the event of an unexpected loss of samples from the other runs. Fuel feed rates and unit operating conditions will be maintained at steady state levels across all replicate sampling runs, to the extent possible.

The length of each sampling run will be determined by both the need to collect sufficient sampling volumes to obtain adequate detection limits in the samples and the need to obtain sufficient operating data for the development of permit limits. Expected sampling run times are described more completely in Section 7 of this Trial Burn Plan.

6.6 Spiking for Required Constituents

GEPMV will spike POHCs and a source of ash during certain test periods of the trial burn. Section 4 of this Trial Burn Plan discusses selection of spiking materials, general spiking procedures, and feed rate calculations.

6.7 Transfer of Measured Emission Rates to the Risk Assessment

Emission testing for the risk assessment will be conducted on both boilers at the same time. Therefore, the emission rates calculated from the risk burn results can be used directly as total facility emissions.

6.8 Proposed Permit Limits

The permit will include limits in three categories: boiler operating limits, emission limits, and constituent feed rate limits. These limits need to be developed based on the results of the trial burn, the results of the site-specific risk assessment, and from calculations performed in accordance with the BIF Rule. This section explains how GEPMV believes the permit limits can be developed for the boilers at the Mt. Vernon plant.

6.8.1 Boiler Operating Limits

Tables 6-1 and 6-2 previously described the boiler operating limits that GEPMV wishes to establish under a RCRA operating permit. GEPMV will operate the boilers at the conditions listed in the tables during the trial burn to generate data to establish the desired limits. Assuming that the emission results from the trial burn indicate compliance with the emission standards, GEPMV will establish the boiler operating limits based on the actual trial burn results. If GEPMV successfully demonstrates DRE, their operating permit will restrict them to burning the specific waste fuel burned during the trial burn.

The numerical value of the limit will be derived from trial burn test data, in accordance with calculation procedures established in the BIF Rule. For each applicable test run, hourly rolling averages will be calculated from the recorded one-minute averages. The highest (or lowest, as appropriate) hourly rolling average from each run will then be identified. The highest (or lowest) hourly rolling average from the runs of the appropriate test conditions will be averaged to generate the numerical limit. This procedure is in accordance with 40 CFR 266.102(e)(6)(i)(B).

The calculation of hourly rolling averages will start with the sixty-first minute of testing, providing 60 one-minute averages that are representative of the emission samples. If emission sampling has to be interrupted during the middle of a run, the one-minute averages during the interruptions will not be used for the calculations of hourly rolling averages after the interruption. The last hourly rolling average considered will be concurrent with the end of the emission-sampling period. If a particular operating limit needs to be calculated from more than one test condition or from sets of three test runs that do not occur simultaneously, then an intermediate value will be calculated from each set of three test runs. The final limit will be the most conservative of the intermediate values.

Since both boilers will be operated during the trial burn, the calculations described in the previous paragraph will be performed using data for both boilers. The final limit will be the most conservative of the values derived separately from each boiler's data. Sample calculations that explain the specific determination of boiler operating limits will be provided in the Trial Burn Report.

As described in Section 6.1, permit limits may be developed for minimum and maximum steam production, minimum waste fuel temperature, and minimum combustion air temperature. These parameters are not independent from other parameters that will be monitored during the trial burn and for which permit limits will be established. For example, steam production is directly related to total thermal input. If limits are developed for these parameters, the numerical value of the limits will be based both on data collected during the trial burn and an engineering assessment of the influence of these parameters on emission rates.

6.8.2 Emission Limits

The permit will include emission limits on the following constituents: carbon monoxide, particulate matter, metals, and hydrogen chloride/chlorine. The development of each of the limit for each constituent is described below.

Carbon Monoxide

As stipulated in the BIF Rule, the proposed permit limit for carbon monoxide will be expressed on a concentration basis, at a value of 100 ppmv, dry basis, corrected to 7% oxygen, and calculated as an hourly rolling average.

Particulate Matter

As stipulated in the BIF Rule, the proposed permit limit for particulate matter will be expressed on a concentration basis, at a value of 0.08 gr/dscf, corrected to 7% oxygen. There is no averaging period attached to this limit.

Metals, Hydrogen Chloride, and Chlorine

The metals, hydrogen chloride, and chlorine emission limits in the permit need to satisfy three regulatory constraints as well as be established at a level that allows continued use of the waste fuel in the boilers. The regulatory constraints are:

1. The emission limit must comply with the BIF Rule emission standard for the individual metals using the RACs and RSDs and the site-specific air dispersion modeling.
2. The emission limit must comply with the BIF Rule emission standard for summed risk from the four carcinogenic metals considered by the rule.
3. The emission limit must be shown to be protective of human health and the environment based on the results of the site-specific risk assessment.

Within those constraints, the emission limits can be developed from calculations that are performed in accordance with the BIF Rule or derived from the risk assessment.

Emission limits for metals and chlorine that satisfy the first two constraints can be developed entirely from calculations that use the RAC and RSD for the individual parameters and the air dispersion modeling. These calculations were explained in Section 3 and presented in

Tables 3-2 and 3-3 of this Trial Burn Plan. However, based on similar work performed at other regulated facilities, metal emission limits developed solely from BIF Rule emission standards will likely lead to an unacceptable result if they are used in a site-specific risk assessment.

Metal emissions will be characterized during the risk assessment testing. The emissions will likely be much lower than the calculated emission limits because the feed rate of metals is far below the calculated maximum feed rate. The metal emission rates used in the risk assessment will therefore likely provide an acceptable level of risk. From these emission rates, it is possible to determine a factor that can be applied to increase the emission rates used in the assessment to a maximum value that would still result in acceptable values for cancer risk and non-cancer effect. The calculated cancer risk and non-cancer hazard quotient for a single parameter at a single receptor is a first-order (linear) function of the emission rate. Therefore, the use of a factor to increase emission rates from a measured value to an allowable maximum is warranted. Increased emissions rates would be checked against both the individual metal and the summed carcinogenic risk emission standards from the BIF Rule. GEPMV will apply this procedure to the results of the trial burn and the formal risk assessment to refine these limits for their incorporation in the permit.

For hydrogen chloride and chlorine, direct inhalation exposure is the predominant contribution to risk, as calculated by the RAC and air dispersion modeling. Hydrogen chloride and chlorine are not usually significant contributors to the indirect exposure risk assessment.

6.8.3 Constituent Feed Rate Limits

For the BIF Rule regulated metals, chlorine and ash, GEPMV is proposing to establish feed rate limits based on both the BIF Rule and the formal risk assessment. After the formal risk assessment is completed, a calculation will be performed to derive the maximum allowable feed rates that satisfy both the BIF Rule and the risk assessment constraints. A factor, derived from the formal risk assessment, will be applied as necessary to obtain feed rates that provide for operational flexibility. Since these constituents assume an adjusted Tier I strategy, (no partitioning or system removal efficiency) the increase between measured results from the trial burn and eventual limits remains conservative.

For the metals nickel and selenium, which are not specifically included in the regulation, GEPMV will establish feed rates in the permit if these metals are detected in the feed stream and are found to be a driver in the risk assessment.

6.9 Post-Trial Burn Operation

The BIF units are currently being operated in accordance with the interim status limits certified in the August 2000 Revised Certification of Compliance. GEPMV will cease the use of waste fuel in any boiler under operating conditions that exceed those established in the current Revised Certification of Compliance upon completion of the trial burn and associated risk assessment testing.

GEPMV will certify compliance with the interim status provisions of the BIF Rule by completing a Recertification of Compliance for Boilers H530A and H530B and submit it to EPA within 90 days after completion of the trial burn. The Compliance Certification (CC) forms to be completed as part of the Recertification of Compliance are listed below:

CC-1 Compliance Certification Form 1
General Facility and Testing Information

CC-2 Compliance Certification Form 2
Deviations from Submitted Notification of Compliance Test

CC-3 Compliance Certification Form 3
Summary of Compliance Test Emissions

CC-4 Compliance Certification Form 4
Summary of Compliance Test Operation Conditions

CC-5 Compliance Certification Form 5
Summary of Operating and Feed Rate Limits

Formal supporting information, including a test summary, test results, quality assurance/quality control discussion, and data acquired during the test will also be submitted with the Trial Burn Report within 90 days of completion of the trial burn.

The BIF units will be operated at the new limits certified in the Recertification of Compliance upon its submittal. GEPMV proposes to continue operating under RCRA interim status requirements until an operating permit is obtained.

7.0 SAMPLING, ANALYSIS AND MONITORING

This section describes the sampling and analysis for the process stream and stack emission samples that will be collected during the trial burn. An overview of the sampling and analytical methods is provided in this section; the QAPP contains more detailed information related to sampling and analysis. Sampling locations are described below and shown on Figure 7-1.

7.1 Feed Stream Sampling

The only samples of the unit process streams collected during the trial burn will be of the waste fuel. The natural gas primary fuel cannot be sampled by standard sampling techniques because it exists in the gas phase under pressure at normal conditions. In addition, natural gas does not contain detectable quantities of regulated constituents (metals, chlorine, or ash) and so does not need to be sampled during the testing.

Samples of the liquid waste fuel stream will be collected every 15 minutes from a dedicated sample port that is installed on the feed tank recirculation line and is upstream of the spiking injection point. Sampling will conducted according to U.S. EPA Method S-004 (Sampling and Analysis Methods for Hazardous Waste Combustion, EPA-600/8-84-002, February 1984). Table 7-1 describes the sampling and analysis of the waste fuel samples.

Samples of the spiking solutions will be collected once during the test condition when they are used. Sampling will be conducted according to U.S. EPA Method S-004 from a sample tap on the spiking system feed line. Each sample will be contained in two 40-mL VOA vials. These samples are archive samples and will only be analyzed if necessary.

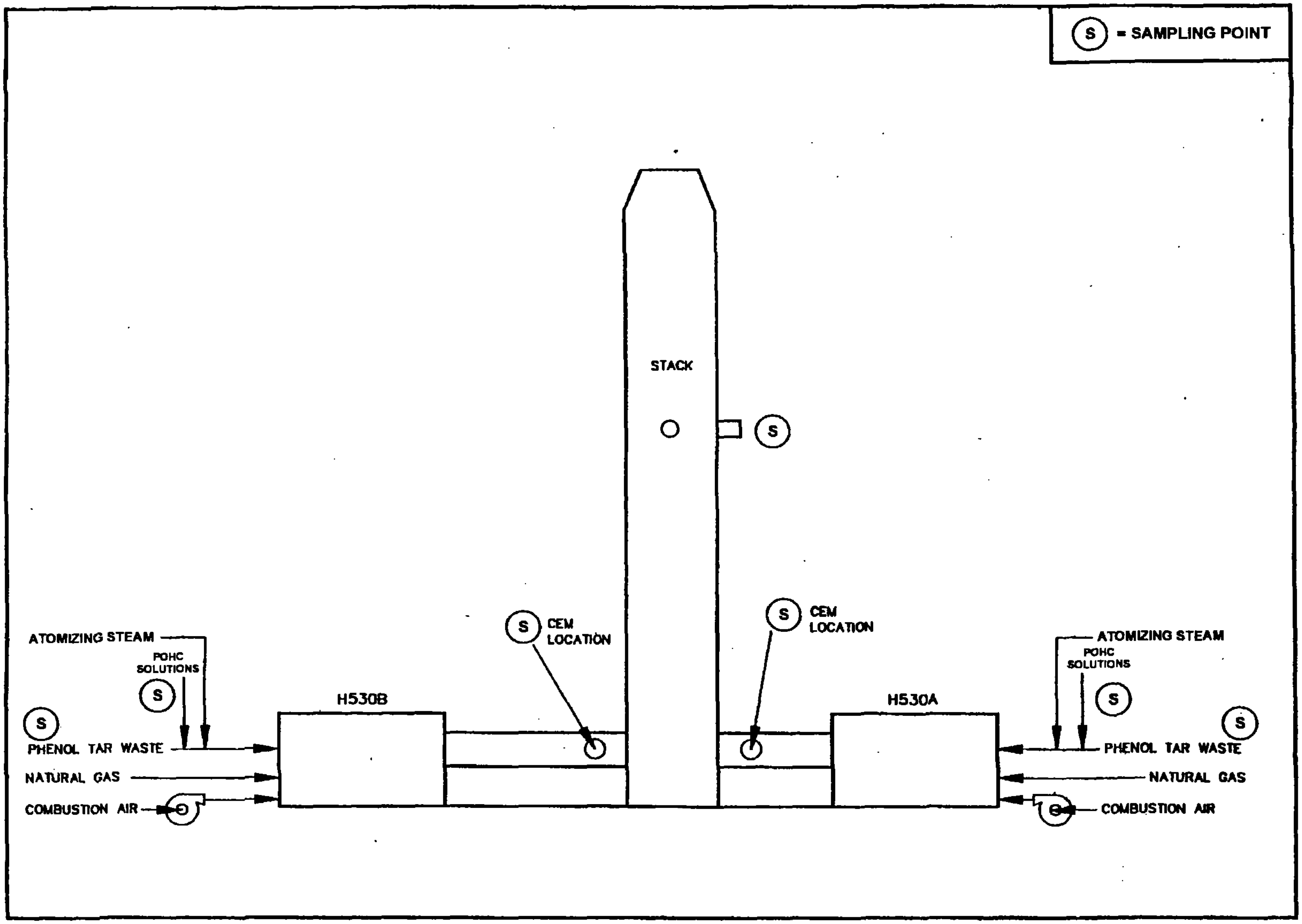


Figure 7-1. Boiler Sampling Locations

Table 7-1

Waste Fuel Sampling Summary

Sample Point Description	Sampling Method	Sampling Frequency	Analytical Parameters (Condition #)	Analytical Method
Sample port in feed tank recirculation line	Modified Tap S-004	Grab subsample each 15 minutes. One composite sample set per run[a], except VOAs composited at analytical laboratory.	Metals (1)	6010B, 7471A
			Chlorine/chloride (1)	9056
			Ash (1)	ASTM
			Volatile Organics (1, 3[b])	8260B
			Semivolatile Organics (1, 2, 3[b])	8270C
			Heating Valve (1, 2, 3)	ASTM
			Viscosity (1, 2, 3)	ASTM
			Density (1, 2, 3)	ASTM
			Moisture Content (1, 2, 3)	ASTM

[a] Since the waste fuel is a viscous fluid, the composite sample container will be mixed after each grab sample addition.

[b] Sampling of VOCs and SVOCs during the Condition 3 will be used to support the risk assessment. Although not specifically required, feed composition data will be helpful during the risk assessment to interpret emissions data.

7.2 Residue Sampling

The utility boilers are not designed to continuously discharge a bottom ash stream. Accumulated bottom ash can only be accessed during boiler shut down. Due to the inaccessibility of the bottom ash, this process stream will not be sampled during the trial burn.

7.3 Stack Emission Samples

7.3.1 Continuous Emission Monitoring System

Samples of the combustion exhaust gases will be collected continuously during the trial burn by the installed CEMS. The sample probe for the CEMS is located in the boiler-specific ductwork leading to the common stack in a position that is in compliance with the methods specified in 40 CFR Part 266, Appendix IX.

The continuously extracted samples of the exhaust gases will be analyzed for CO and O_2 concentration by the installed analyzers that are part of the CEMS. These monitors were installed and are maintained in accordance with the requirements of 40 CFR Part 266, Appendix IX.

7.3.2 Manual Method Samples

In addition to the exhaust gas sampling that supplies the CEMS, samples of stack exhaust gas will be collected during the trial burn to obtain emission data for the other desired constituents. The number and location of sampling traverse points necessary for isokinetic and flow sampling are determined using EPA Method 1 (40 CFR Part 60, Appendix A) protocols. Figure 7-2 shows the stack traverse point locations.

Stack emission samples will be collected in accordance with the appropriate methods. Table 7-2 summarizes the sampling and analytical methods that will be used during the trial burn.

	LINEAR DIMENSION	DUCT DIAMETERS
A	55'	6.94
B	34'	4.29
C	95"(I.D.) 96"(O.D.)	
D	59.6"	

TRAVERSE POINT	DISTANCE % of diameter	DISTANCE (inches)
1	2.1	2
2	6.7	6 3/8
3	11.8	11 3/16
4	17.7	16 13/16
5	25.0	23 3/4
6	35.6	33 13/16
7	64.4	61 3/16
8	75.0	71 1/4
9	82.3	78 3/16
10	88.2	83 13/16
11	93.3	88 5/8
12	97.9	93

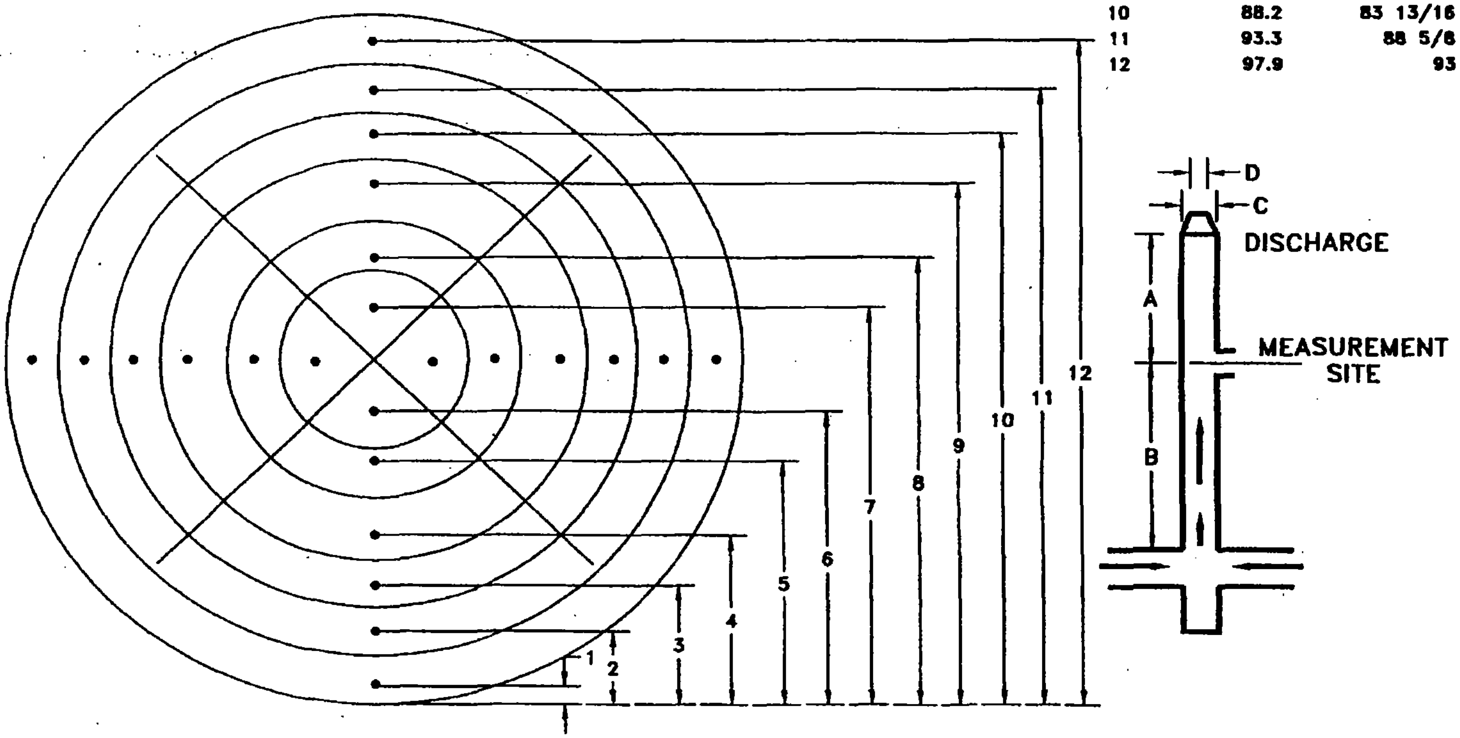


Figure 7-2. Traverse Point Locations

Table 7-2

Emissions Sampling and Analytical Parameters

Parameter	Condition	Sampling Method	Sampling Frequency	Sample Size	Analytical Method
Metals	1	SW-846 Method 0060	2+ hour integrated sample	1.25 m^3	SW-846, Method 6010B
Hexavalent Chromium	1	SW-8496 Method 0061	2+ hour integrated sample	1.25 m^3	SW-846, Method 7199
HCl/Cl_2	1	SW-846 Method 0050	2+ hour integrated sample	1.7 m^3	SW-846, Method 9057
PM	1	SW-846 Method 0050	2+ hour integrated sample	1.7 m^3	40 CFR 60, Appendix A, Method 5i
Volatile Organics (VOST)	3	SW-846 Method 0030	collect 4 samples (tube pairs)	10L	SW-846, Method 5041A/8260B (modified)
Semivolatile Organics (SVOST)	2,3	SW-846 Method 0010	2+ hour integrated sample	3 m^3	SW-846, Method 8270C
PAHs	3	SW-846 Method 0023A	collected with SVOST	3 m^3	CARB 429
Dioxins/Furans	1	SW-846 Method 0023A	2+ hour integrated sample	3 m^3	SW-846, Method 0023A
Aldehydes/Ketones	2,3	SW-846 Method 0011	2+ hour integrated sample	45 ft^3	SW-846, Method 0011
Total Organic Emissions	3	SW-846 Method 0010 and 0040	2+ hour integrated sample	25L; 3 m^3	EPA/600/R-96/036 Field GC/FID, Purge and Trap GC/FID, GC/FID and Gravimetric
Particle Size Distribution	1	SW-846 Method 0050/CARB 501	collected with PM	1.7 m^3	SEM/CARB 501
CO, O_2	1, 2, 3	Plant CEMs Certified per 40 CFR 266, App IX, Section 2.1	sampled over entire test run (minimum 3 hrs)	N/A	N/A
Carbon Dioxide, O_2	1, 2, 3	40 CFR 60, Appendix A, Method 3	w/Methods 0050, 0010	N/A	40 CFR 60, Appendix A, Method 3
Moisture	1, 2, 3	40 CFR 60, Appendix A, Method 4	w/Methods 0050, 0010	N/A	40 CFR 60, Appendix A, Method 4
Gas MW, Flowrate	1, 2, 3	40 CFR 60, Appendix A, Method 2-3	w/Methods 0050, 0010	N/A	40 CFR 60, Appendix A, Method 3

8.0 QUALITY ASSURANCE/QUALITY CONTROL

The sampling and analysis procedures associated with the trial burn will include a quality assurance/quality control (QA/QC) program as an integral part of the overall technical effort.

Quality assurance is the system for ensuring that all information and data gathered under a specific task meet the objectives of the trial burn. A quality control program verifies project quality by defining the frequency and methods of checks, audits, and reviews necessary to identify problems, determine corrective action, and document project quality.

The QA/QC program is described in detail in the QAPP, which has been prepared as a separate, companion document to this Trial Burn Plan.

9.0 SCHEDULE

This section describes the schedule GEPMV intends to follow to accomplish the trial burn. Two schedules are provided. The first describes the overall schedule for planning, executing, and reporting on the trial burn; the second describes a detailed schedule for the field effort. These schedules must still be considered tentative because changes or modifications may arise during the ongoing review and approval process for the Trial Burn Plan.

9.1 Overall Project Schedule

Table 9-1 provides an overall project schedule for the trial burn and permitting activities. The schedule assumes that EPA will approve the Trial Burn Plan and QAPP in February 2001 and that the trial burn will be begin in April 2001, after the potential for inclement weather is reduced.

9.2 Detailed Trial Burn Schedule

Table 9-2 provides a more detailed schedule associated with the day-to-day activities of the trial burn. This schedule includes days for arrival, safety orientation, and testing. This schedule assumes that three individual test runs to collect the planned emission samples can be completed over the course of a 12 to 14-hour day. Testing will be conducted during "extended" day shifts, no around-the-clock testing is planned. The schedule proposed in Table 9-2 includes the same testing as that shown in Section 6 of this Trial Burn Plan.

9.3 Quantity of Waste Fuel to be Burned

The quantity of waste fuel to be burned during the trial burn is based on a target feed rate of 4,800 lb/hr/boiler for 24 hours per day or 115,200 lb/day/boiler. Waste fuel will be fed to both boilers during the stack testing. Current estimates are six days of testing on two boilers. Under these circumstances, 1,382,400 pounds of waste fuel would be burned.

Table 9-1

Trial Burn and Permitting Schedule

Task	Schedule	Status
1st Draft Trial Burn Plan Submittal	2/99	Complete
EPA Review and Comment (1st round)	6/00	Complete
GEPMV Comment Response and Revisions	6/00—9/29/00	Currently Working
EPA Review and Approval of TBP and QAPP	10/2/00—10/27/00	Planned
Prepare Public Notice	10/30/00—12/1/00	Planned
Public Notice Comment Period	12/4/00—1/12/01	Planned
EPA Approval of TBP and QAPP	1/15/01—2/23/01	Planned
Preparation for the Field Effort	March 2001	Planned
Trial Burn Field Effort	April 2001	Requires 1 week to complete scheduled testing
Submit Trial Burn Report	July 2001	Must be no later than 90 days after completing field effort
Submit Recertification of Compliance	July 2001	Must be not later than 90 days after completing field effort
Conduct Risk Assessment and Submit Report	November 2001	Assume 4 months from trial burn report
Draft Permit Development	To be determined	To be determined

Table 9-2

Detailed Trial Burn Schedule

Day Count	Day Of Week	Testing Day	Stack Parameters	Fuel Parameters	Spiking	Test Condition	Operating Condition	No. of Boilers
1	Monday	--	Arrival/Safety Orientation/Set-up					
2	Tuesday	1	(Runs 1, 2, 3) Metals, Hexavalent Chromium, CO, O_2 (CEMS)	BIF Metals,	None	1	HIGH	2
3	Wednesday	2	(Runs 1, 2, 3) HCl/Cl_2, PM, Dioxins/ Furans CO, O_2 (CEMS)	Total Chloride, Ash, VOCs, SVOCs	Ash	1	HIGH	
4	Thursday	3	(Runs 1, 2, 3) PM, PSD, CO, O_2 (CEMS)	Ash	None	1	HIGH	
5	Friday	--	Scheduled Day Off (includes transitioning the boilers from the HIGH to LOW operating condition)					
6	Saturday	4	(Runs 1, 2, 3) Aldehydes/Ketones, SVOCs, CO, O_2 (CEMS)	SVOCs	POHC	2	LOW	

Table 9-2 (Continued)

Detailed Trial Burn Schedule

Day Count	Day Of Week	Testing Day	Stack Parameters	Fuel Parameters	Spiking	Test Condition	Operating Condition	No. of Boilers
7	Sunday	5	(Run 4) Aldehydes/Ketones, SVOCs, CO, O_2 (CEMS)	SVOCs	POHC	2	LOW	2
			(Runs 1 and 2) PAHs, Aldehydes/Ketones, CO, O_2 (CEMS)	VOCs, SVOCs	None	3	LOW	
8	Monday	6	(Run 3) PAHs, Aldehydes/Ketones, CO, O_2 (CEMS)	VOCs, SVOCs	None	3	LOW	
			(Runs 1 and 2) VOC, SVOC, TOE, CO, O_2 (CEMS)	VOCs, SVOCs	None	3	LOW	
9	Tuesday	7	(Run 3) VOC, SVOC, TOE, CO, O_2 (CEMS)	VOCs, SVOCs	None	3	LOW	
			Equipment Tear-Down, Shipping, and Departure					

Stack Notes: Boiler stack ports currently allow a maximum of 4 manual method trains (with staggered start).

APPENDIX A

QUALITY ASSURANCE PROJECT PLAN

APPENDIX B

DISPERSION MODELING REPORT

APPENDIX C

REVIEW OF 40 CFR 261 APPENDIX VIII CONSTITUENTS

APPENDIX D

EQUIPMENT & INSTRUMENTATION SPECIFICATIONS

APPENDIX G

HUMAN HEALTH RISK ASSESSMENT WORK PLAN

APPENDIX E

ENGINEERING DRAWINGS

APPENDIX F

BOILER START-UP & SHUTDOWN PROCEDURES

Normal Startup
Normal Operation and Alarms
Soot Blowing
Chemical Addition
Temporary Power Outage
Low Water Shutdown Function Test

APPENDIX H

ECOLOGICAL RISK ASSESSMENT WORK PLAN